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AN INTRODUCTION

TO

Z O O L O G Y.

BY

PHILIP HENRY GOSSE,

AUTHOR OF "THE CANADIAN NATURALIST."

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TO MY BROTHER,  
THOMAS GOSSE, OF BRUTON,  
IN SOMERSETSHIRE,  
MY EARLY COMPANION IN ZOOLOGICAL PURSUITS,  
THESE VOLUMES ARE INSCRIBED ;  
IN TESTIMONY OF AN AFFECTION,  
WHICH  
THE LAPSE OF YEARS  
SERVES BUT TO STRENGTHEN AND  
INCREASE.



## P R E F A C E.

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THE object of the present Work is to set forth the Divine Wisdom and goodness as displayed in the animate creation. With this view, the Author has endeavoured so to divest it of mere technicalities as to be intelligible and interesting to general readers, and, at the same time, to render it not unsuited as a manual to those who wish to enter upon the study of Zoology as a science. He has not, therefore, confined himself to the biography of animals, however amusing, but has aimed to shew the amazing diversity in the details of animal structure; its perfect adaptation to required functions; the modification of organs common to various forms; the development of intelligence; and the union of all into a grand whole, so perfect, so beautifully consistent, that none but an All-wise Mind could have contrived, none but an Almighty Hand could have created it.

The species selected for illustration are, in many cases, those which are less generally known; and the facts adduced are, it is believed, such as rest on undoubted scientific authority, and are brought down to the present state of science. The *Invertebrate* Classes, hitherto scarcely noticed in our ele-

mentary books, or dismissed in a few closing pages, have received an attention somewhat more suited to their importance : but in these, as well as in the other Classes, the impossibility of doing anything like justice to a subject so vast, within the limits of two small volumes, has been strongly and sometimes painfully felt. The Author presumes to hope, however, that some who may peruse the following pages may be induced to study the subject more extensively, and thus open to themselves sources of gratification, as innocent as they are delightful.

KENTISH-TOWN.

*April*, 1844.

## INTRODUCTORY REMARKS.

---

WE are surrounded on all sides by a world of life, distinct from our own, comprising beings of amazing variety of form, and of many grades of intelligence and perception. Meeting us at every turn, mixed up with our daily occupations, ministering to our comforts and necessities, it is not surprising that, in all ages, man should have craved to know more of the denizens of this other world, of which he sees so much, and yet knows so little. Of external faculties, and internal organization, it is apparent that they possess a greater or less community with ourselves, and the degree of this community, the anatomist is able to measure with considerable precision. But of their feelings, affections, and thoughts, we know comparatively nothing, and of their destiny we are utterly and absolutely ignorant. The inquiry will sometimes force itself upon us—Is that intelligent principle which we are accustomed to call instinct, but which seems in many cases to differ from reason but in degree, extinguished and annihilated in death? or does its spark burn with a

brighter light in another state of being? The Scriptures afford no clue by which to answer these questions, and, from the animals themselves we can gain no information, being precluded from anything like an interchange of ideas, by the want of a channel of communication. Our acquaintance with them is thus of necessity limited to the observations which we are enabled to make by watching them in their native haunts, or studying them in a state of domestication, and to the conclusions which we endeavour to draw from anatomy, and from analogy. These observations, accumulated by the labours of ages, form the basis of that branch of Natural History of which this work is intended to treat, Zoology.\* From the scarcity of many of the subjects, their remoteness from civilized countries, their jealous seclusion in recesses the most wild and difficult of access, and the brief and casual and often solitary notices on which many of our recorded conclusions rest, the science still contains much that is erroneous in theory, and false in fact. Of exceedingly few animals can our knowledge be said even to approach perfection; of the great majority we know very little, of some we know barely the form, or perhaps the skeleton, or perhaps a single disjointed limb:—while there are vast tracts of land, such as the interior of Australia, the expanse of Africa, the immense islands of the Indian archipelago, Madagascar, and New Zealand, some of which teem with animal life in its most gigantic forms,—where the foot of civilized man has never trod.

\* Ζῷον, *zoon*, an animal, and λόγος, *logos*, a discourse.



The beginner in scientific studies is apt to be discouraged by the boundlessness of the field over which he glances. The number of the objects of his study is so vast, that he knows not where to begin his selection. And, indeed, this view is sometimes depressing to the experienced naturalist, who loving his science for its own sake, earnestly desires its perfection; but who is compelled to feel how little progress can be made in the short period of his life. In Entomology, not much less than a hundred thousand species are already named, without a limit being even approached.\* But in another view, the very vastness of the subject is an encouragement to perseverance, as patient observation is sure to be rewarded by the discovery of new facts. And here we may notice an erroneous opinion, which is liable to be entertained in the outset of an attempt at out-of-door observation; that the familiar animals around us are already so well known, as to afford no probability of

\* The present state of science affords data for Zoologists to conjecture, with some approximation to truth, the probable number of existing species of animals. Mr. Swainson has given the following as his estimate, deduced from facts and principles already known. (See *Geog. and Class. of Quadrupeds*, page 28.)

Quadrupeds . . . .	1200	Worms . . . .	2500
Birds . . . . .	6800	Radiata . . . .	1000
Reptiles . . . . .	1500	Polypes, &c., . .	1500
Fishes . . . . .	8000	Testacea . . . .	4500
Insects . . . . .	550,000	Naked Testacea . .	600

making a total of 577,600 species. We may be permitted to observe that to us, this estimate appears, in several particulars, to be much within the probable limits.

discovering any thing new in their economy. So far is this from being the case, that we doubt not if any one were to lay himself out patiently to watch, and carefully to observe, the habits of the Mice that infest our cupboards, or the Sparrows that throng our housetops, he would find highly interesting and unknown facts resulting from his minute observation, which would abundantly repay his labours.

Naturalists may be divided into two classes, according to the department of study in which they labour. The first are those who, by philosophic induction, comprehensive research, and enlarged generalization, endeavour to discover "the grand and harmonious plan upon which all organic creation is believed to have been formed," to trace, link by link, the complex folds of that mighty chain which runs through all orders of being. The other class consists of that far more numerous body, who choose the humbler sphere of field observation, a task to which no capacity is incompetent, and in the prosecution of which there is a peculiar freshness which never satiates. But it is obvious that, to give definiteness and precision even to field researches, some arrangement is necessary; and the labours of many honoured names in science have been devoted to the formation of systems in which any newly discovered form should, more or less obviously, take its place. The points of difference and resemblance in structure or habits which have been selected as the foundation of systems, are very various: we shall mention a few of the classifications adopted from earliest times.

The first and most obvious distribution seems to have been founded on the localities frequented by animals,—“the beast of the earth, the fowl of the air, and the fish of the sea;” separating, however, from the first “the creeping thing:” this we find in the Mosaic account of the Creation. In the sacred narrative of the Deluge, the same arrangement is adopted as regards the terrestrial and aërial animals; and beasts are farther divided into “clean and unclean.” But indications of a much more elaborate division appear in the Book of Leviticus (ch. xi.), and in the parallel passage in Deuteronomy (ch. xiv.), which we notice the more readily, because it is by far the earliest attempt at that orderly arrangement which we usually designate system, and because it seems to have been altogether neglected by those who have written the history of our science. The principal orders of animals seem very clearly distinguished: “Whatsoever parteth the hoof, and is cloven-footed, and cheweth the cud among the beasts,” (Lev. xi. 3,) indicates, of course, the Ruminants of modern science; “the Coney,” and “the Hare” (ver. 5 and 6) may be considered as typical of the Rodentia,\* and “the Swine” (ver. 7) of the Pachydermata; while “whatsoever goeth upon his paws, among all manner of beasts that go on all four,” (ver. 27,) seems to point out clearly enough the Carnivora. Then, among aërial animals, we

\* It does not seem a sufficient objection to this view, that the classification is not in all respects natural: admitting the Coney to be the modern Hyrax, and a true Pachyderm, still its external appearance is that of a Rodent.

have, somewhat less distinctly, the Raptores, Insesores, Natatores, and Grallatores, associated, however, with the Bat; all of which, being prohibited, leave the Gallinaceous Order separated as clean (ver. 13—19). The “fowls that creep, going upon all four,” (ver. 20,) and the “flying creeping things,” (ver. 23,) are not unaptly descriptive of winged Insects, among which the Saltatory Orthoptera are graphically noted as those creeping things “which have legs above their feet, to leap withal upon the earth” (ver. 21). The Aquatic tribes are distinguished into “such as have fins and scales in the waters,” (ver. 9,) the true Fishes, and “all that have not fins and scales,” (ver. 10,) perhaps meaning the Amphibia. Besides these, there is a heterogeneous assemblage of creatures, denominated “creeping things,” (ver. 29,) of which small size seems to be the only common character, including (at least, *in our translation*,) “the weasel, the mouse, and the tortoise after his kind, and the ferret, and the chameleon, and the lizard, and the snail, and the mole.” In order to estimate the value of this arrangement, we must bear in mind that the object of the sacred writer was not at all a systematic distribution of the animal kingdom, which is only casually introduced for the purpose of instituting a ceremonial permission or prohibition of certain sorts of animal food; that the animals noticed are only those of a very limited district, and, out of these, none but such as might offer any temptation to be used as food; and that the incongruities and anomalies would probably be much di-

minated, could we with certainty know the species in every case intended by the sacred historian.

About a thousand years after this classification, (if we may be allowed so to term it,) flourished the Greek philosopher Aristotle, a man who, for the versatility of his genius, the extent of his researches, the soundness of his judgment, and the grandeur of his ideas, stands, perhaps, without a rival, the object of our wonder, admiration, and reverence. He was the first writer who treated expressly of Zoology, whose writings have descended to our times. He arranged all animals in two great divisions:—I. such as have blood; and II. such as are without blood. The former he subdivided into those that produce living young, viz., Man, Quadrupeds, and Cetacea; and those that produce eggs, viz., Birds, Fishes, and Reptiles. The bloodless division comprised,—Insects, which he distinguished as possessed or deprived of wings, and the Soft-bodied animals, corresponding generally to the *Worms* of the modern system of Linnæus. Such is a brief outline of the Zoological system of Aristotle.

For about two thousand years afterwards, the science of Zoology appears to have been consigned to almost total oblivion, or at least in the writings of the few isolated individuals who professed to treat of it, to have degenerated into a few common-place facts, overwhelmed with heaps of absurdities and childish fables. In the seventeenth century, however, the attention of mankind began to awake once more to the study of Natural science, and many illustrious

men devoted their labours to its promotion, both in the observation of facts and in systematic arrangement. At this period, Linnæus, taking, as his great predecessor had done, the circulatory system as the foundation of his arrangement, distributed animals into three great divisions, each containing two classes, viz. :

I. Such as have a heart with two auricles and two ventricles ;\* the blood warm and red ; containing,—

Class 1. Such as produce living young—Mammalia.

2. Such as produce eggs—Aves.

II. Such as [he supposed to] have a heart with but one auricle and one ventricle ; the blood cold and red ; containing,

Class 3. With the lung voluntary—Amphibia.

4. With gills instead of lungs—Pisces.

III. Such as have a heart with a single auricle and no ventricle ; a cold and white fluid in the place of blood ; containing,

Class 5. Such as have antennæ†—Insecta.

6. Such as have tentacula‡—Vermes.

These six Classes he divided into Orders ; founding his characters chiefly on the organs of eating, and those of motion. The Mammalia were characterized by the number, form, and position of the teeth ; the Birds, by the form of the beak and feet ; the

\* The auricles are bags at the base of the heart, which receive the blood from the veins ; the ventricles are the large cavities of the heart, which drive the blood into the arteries.

† Jointed organs projecting from the head.

‡ Fleshy projections, not jointed.



Amphibia, by the presence or absence of feet; the Fishes, by the structure of their gills, and the position of their fins; the Insects, by the number, form, and structure of the wings; but the Class called Vermes, a confused assemblage of the most diverse materials, was divided on no definite or legitimate principle whatever. Each order was distributed into subordinate groups, called Genera, and each genus into Species. As this last term is often somewhat vaguely used, it may not be useless to define its acceptation. It is used to signify those distinct forms which are believed to have proceeded direct from the creating Hand of God, and on which was impressed a certain individuality, destined to pass down through all succeeding generations, without loss and without confusion. Thus, the Horse and the Ass, the Tiger and the Leopard, the Goose and the Duck, though closely allied in form, are believed to have descended from no common parentage, however remote, but to have been primary forms of the original creation. It is often difficult in practice to determine the difference or identity of species; as we know of no fixed principle on which to found our decisions, except the great law of nature, by which specific individuality is preserved,—that the progeny of mixed species shall not be fertile *inter se*. That animals of different species will breed with each other, as the Horse with the Ass, is universally known; and the progeny have, in many instances, again bred with either of the parental species: but there is

no instance of Mules, or any other hybrids, being capable of procreation *between themselves*. Diversities of size, figure, and colour, sometimes occur between individuals of the same species in a wild state, and are very frequently found in a state of domestication; but the former are inconstant and transient, and the latter seem dependent for perpetuation on the watchful care of man; and in both cases, there is a constant tendency to revert to the typical condition of the race. Such accidental deviations are known by the term *varieties*.

We cannot dismiss the arrangement of Linnæus, without noticing the simple but most happy invention of the *nomen triviale*, or specific name. Before his time, Naturalists, in speaking of any particular animal, were compelled to give a short description of it, such as "the lesser grey Shrike, with a white spot on the scapulars," "the smallest Lark with a Grasshopper's voice," which even in that age was extremely awkward, and in our day of multiplied species would be utterly impracticable. Linnæus registered the specific characters of the subject, and designated it by a single term, which with the name of its genus prefixed should at once distinguish it from all others, exactly in the manner of the Christian and family names of a man. Thus in the examples adduced, having given the name *Lanius* to the Shrikes, and *Alauda* to the Larks, he distinguished these two species as *Lanius Rutilus* and *Alauda Trivialis*. By this simple expedient, he conferred a benefit upon



science, in which no improvement has been made, and which would alone entitle him to the thanks of posterity.

But the system of Linnæus was destined to yield to a successor. It was avowedly artificial; but, from the imperfect state of zoological knowledge in his day, it was impossible that it should be otherwise. The impulse, however, which it gave to science was soon perceived in the vast and rapid influx of new information; and, soon after the beginning of the present century, materials sufficient were in the possession of scientific men to enable M. Cuvier, in concert with his distinguished associates, to put forth a new arrangement of the "Animal Kingdom," founded on its organization. This distribution we purpose mainly to follow in the present treatise, not because it is not susceptible of improvement, but because it has attained a well-deserved celebrity, is the best known and the most used. He wisely selected the NERVOUS SYSTEM as the basis of his great divisions, as this appears to be more essentially connected with animal life than any other organs. He considered that we find in Nature "four principal forms, four general plans,—on which all animals seem to have been modelled;" and accordingly he distributed the Animal Kingdom into four principal Divisions, which he named VERTEBRATA, MOLLUSCA, ARTICULATA, and RADIATA.

The distinguishing characters of these primary groups may be briefly expressed as follows:

VERTEBRATA.—Having a single nervous centre, or axis, running through the body, enclosed in a bony case.

MOLLUSCA.—Nervous system consisting of several detached masses, irregularly scattered about the body; no bony skeleton.

ARTICULATA.—Nervous system consisting of two parallel nervous cords, running through the body, thickened at intervals into knots or *ganglions*.

RADIATA.—No distinct nervous system; organs of sense and motion arranged in a circular form, like rays around a centre.

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## ERRATA.

### VOL. I.

- Page 85, line 21. Dele "the."  
" 158, " 28. For "kind" read "hind."  
" 216, " 15. Col. 2, for "an" read "and."  
" 282, " last. For "branch" read "bunch."  
" 362, notes. Reverse the references.

### VOL. II.

- Page 74, note. For "antiq" read "antiquity."  
" 152, " For "repute" read "reputed."  
" 294, beneath the engraving, for "*Cyclopa*" read "*Cyclops*."  
" 352, line 12. For "black or orange" read "black and orange."  
" 354, note. For "*Coronis* ——?" read "*Castnia Coronis*."





# ZOOLOGY.

---

## FIRST GREAT DIVISION.

### VERTEBRATA.

THE highest forms of animal structure are distinguished by having the nervous matter, the source of all sensation and intelligence, concentrated into a single mass, which may, however, be conveniently considered as consisting of two parts, *viz.*, a long slender column, the *spinal marrow*, running through the length of the body; and a greatly enlarged mass, situated at its front extremity, and called the *brain*. To protect this most delicate and precious substance from external violence, it is encased in a strong bony covering; that part which defends the spinal marrow, taking the form of a number of small perforated bones, called *vertebræ*, jointed to each other by cartilage, so as to make a continuous tube, while the covering of the brain forms a box, more or less globular, called the *skull*. Through orifices in these bones ramifications of nervous matter proceed to all parts of the body, and are the medium of sensation. The organs of the higher senses are situated in the immediate vicinity of the brain.

For the voluntary change of situation, most animals of this Division are furnished with *limbs*, usually four in number, arranged in pairs. These vary in form and function in the different classes. Food is received and in some degree prepared for digestion by the action of the *jaws*, the lower of which moves perpendicularly. In general they are armed with bony projections called *teeth*, which cut or grind the food ; but in the class of birds, and in the tortoisès, these are wanting, the jaws being encased in a horny *beak*. The food passes from the mouth through a tube into a sac called the *stomach*, where it undergoes certain chemical changes, and receiving various secretions from the body, goes into a lengthened membranous tube, called the *intestine*, the sides of which are studded with innumerable little vessels, by which the nutritious portion of the food is taken up, and conveyed into the veins to form blood, the useless portion being rejected.

Before the supply of nutritious matter, which we have just seen poured into the veins, can be made available for the support of the body, it must undergo some important changes. These are effected by the admixture of *oxygen*, derived generally from the atmosphere ; but, in the class of fishes, from the water. To understand in what manner this admixture takes place, we must glance a moment at the *circulatory system*. All the animals of this Division are copiously supplied with a fluid essential to their existence, called *blood*, from which it is believed all other parts of

the body, even the most solid, were originally formed, and by which they are increased and supported. This fluid ceaselessly circulates through two series of vessels, ramifying with inconceivable minuteness to every part of the animal. In the one set, called *veins*, receiving the blood after it has performed its renovating office, we have said that it mixes with foreign matter from the digested food; thus supplied, it is carried to the *heart*, a large hollow muscle, which alternately contracts and expands without intermission; by which motions it is received and thrown forward in regular pulsations. Hence, in whole or in part, it is carried, in those animals which breathe air, to the *lungs*, a spongy mass of minute cells communicating with the external air. Over the surface of these cells the blood-vessels ramify, and their coats become so thin as to admit the union of the oxygen with the contained blood, the result of which is an instant change of its colour from dark red to vivid scarlet. The *gills* of fishes perform the same office as the lungs. The blood thus renewed is returned by veins to another chamber of the heart, whence it is ejected into the other set of vessels, called *arteries*, which, large at first, but branching with innumerable ramifications, convey it to every part, and at last, in a manner not thoroughly understood, transfer it into the extremities of the veins, which, as we saw, carry it back to be renewed again.

The young are produced in all cases from *eggs*, which exist in the body of the female; in some cases

the young animal is excluded from the egg within the body of the parent, while in others the egg itself is produced, and the young hatched some time afterwards.

This great division embraces four subdivisions or classes, characterised by the kind or power of their motions, which depend on the quantity of their respiration.

I. MAMMALIA. In these the circulation is double, all the blood passing through the respiratory organ, previously to resuming its former course through the arteries : the respiration is aërial and simple ; that is, performed in the lungs only.

II. BIRDS. Circulation double ; respiration aërial, performed in many other cavities besides the lungs ; the air penetrating their bodies, and bathing the great arteries.

III. REPTILES. Circulation simple, part only of the blood passing through the respiratory organ, the remainder returning directly to the body.

IV. FISHES. Circulation double ; but respiration aquatic, and therefore small in quantity.

From the respective amount of respiration in each class, result the different sorts of motion for which they are chiefly designed : Mammals, in which the quantity is moderate, have (generally) the precision and vigour requisite for walking and running : Birds, which have a greater quantity, possess muscular strength and lightness sufficient for flight : Reptiles, in which it is diminished, usually creep, and many pass a portion of life in a state of torpor : while

Fishes, which respire least of all, require to be supported in a fluid whose specific gravity is nearly as great as their own. The last three of these classes are marked, moreover, by producing young enclosed in eggs, while the first bring forth living offspring.

### CLASS I.—MAMMALIA.\*

It has always been usual to begin the great chain of Nature with this class; being that in which the sensations and faculties are found in the highest state of developement, and which in its highest link, MAN, takes hold of a superior form of being, joining the merely animal existence with that which is purely intellectual and spiritual.

It is not necessary, in a work like the present, to enter into the details of its comparative anatomy further than may suffice to give a clear notion of the distinctive characters of the animals contained in it.

Though, as the quantity of their respiration is but moderate, they are generally designed for vigorous motion on a solid support, a few can, by a modification of the extremities, and an extension of certain membranes, perform real and continued flight; while others, by a very different structure, are adapted for an aquatic life alone. Both the Bats and the Whales, however, are true Mammalia.

The upper jaw is always fixed to the skull; the lower, formed of but two pieces, is attached by a sort of hinge to a fixed temporal bone; the neck consists

\* *Mamma*, the female breast.

of seven\* vertebræ, in the Giraffe, as in the Whale; the anterior ribs are connected with the breast-bone (*sternum*) by cartilage; the arm, or fore-leg, commences in a shoulder-blade that is not jointed to the skeleton, but imbedded in the flesh, often resting on the sternum by an intermediate bone, called a clavicle, or collar-bone. The limb jointed to the shoulder-blade consists of an arm, a fore-arm, and a hand, the latter being composed of two ranges of small bones, called the *carpus*, another range called the *metacarpus*, and the fingers, each of which consists of two or three bones, called *phalanges*. The hinder extremities in all except the Whale tribe (in which they are wanting) are attached to the spine, by means of a bony circle called the *pelvis*. To this is attached the thigh, succeeded by the two bones of the leg, and terminated by bones resembling those of the fore-limb, the *tarsus*, *metatarsus*, and toes. The skin is usually defended by a covering of hair, but in many of the larger races it is very scanty, and in the *Cetacea*, or Whales, it is almost entirely wanting. The young are in all cases produced alive, and are nourished for some time by milk, a peculiar fluid secreted in the *mammæ* of the mother; a distinctive character, which has given name to the class.

The subdivision of the Mammalia into orders is founded on certain differences in the organs of touch, (hands or feet,) and those connected with the taking of food (teeth). The degree of perfection in the

\* The Three-toed Sloth, so long believed to have nine cervical vertebræ, has been proved to be no exception to the universal rule.

former depends on the number and pliability of the fingers, and on the extent to which they are covered by the nail or hoof. The nature of the food is shown by the form of the grinders, with which the motion of the jaw always corresponds. In those which eat flesh, the grinders are as trenchant as a pair of shears, and the jaws have only a vertical motion, opening and shutting. In those which eat vegetables, the grinders have flat crowns, and the jaws have a lateral or grinding motion, the surfaces of the teeth being rubbed together. Animals which have the toes enclosed in a hoof are vegetable feeders, as they are unable to seize prey; but all whose toes are free are not flesh-eaters. In these there is much variety in the nature of their food, and they differ greatly in the freedom, pliability, and delicacy of their toes. In some we see a thumb diverging from, and capable of being opposed to, the extremities of the other fingers, forming a true hand: this modification vastly increases the powers of the limb, and very materially affects the habits of its possessors. It is most perfectly developed in Man, and has been used to characterise his position in the system of Nature, considered as an animal; of which we shall merely say, that his zoological character consists in his having hands on the anterior extremities only.

ORDER I.—BIMANA.\*

And God having “made of one blood all the nations of men,” his single species occupies the whole order, and we proceed at once to Order II.

\* *Bis*, twice, and *manus*, a hand.



## ORDER II.—QUADRU MANA.\*



The ORANG-OTAN (*Simia Satyrus*), GIBBON (*Cynocephalus Mormon*),  
and SPIDER MONKEY (*Ateles Frontalis*).

This order of animals has always possessed the greatest interest to naturalists; being, of all, that which bears the closest similarity to the human form and structure, although the separating chasm, even in these respects, is still immense. The character by

\* *Quatuor*, four, and *manus*, a hand.



which they are distinguished is, that the thumb in all the extremities is opposable to the fingers, which are long and flexible ; but, besides this, there are many other differences in their anatomy, abundantly sufficient to satisfy our self-respect. The whole order is formed for living in the trees of tropical forests, where the prehensile character of all the feet renders them perfectly at home. Here they run, and jump, and drop, from bough to bough, with a wonderful agility, but poorly represented by any feats of a similar kind performed in a state of captivity. Another peculiarity in the hind feet, while it causes awkwardness and pain in walking erect, admirably assists them in climbing. The feet are not set at right angles to the legs, so as to come flat on the ground as in man ; but the soles nearly face each other, so that, when erect, the body rests on the outer edge of the foot. The legs, too, are not in the same line as the thighs, but directed inward, so that they may be termed bow-legged. The arms are much elongated, and the fingers are very long in proportion to the thumbs. The skull, even in the true Apes, lacks the rotundity and volume which distinguish man ; and the lower part of the face, the muzzle, is prominently developed, becoming increasingly brutal as we proceed downward through the Baboons and Monkeys, where, in the presence of a tail, and the general contour and habit, we gradually lose all resemblance to the human form.

Of the higher Apes we possess but a limited know-

ledge. A few have been brought to Europe, but only in early youth; and it is doubtful whether the adult animals, except in one or two instances, have ever been seen by Europeans. Two species have been established, and perhaps there are indications of one or two more, constituting the genus

*Simia*,\* *the Orang.*

Of the two known species, the one which seems to approach the nearest to the human form is the Chimpanzee, (*Simia Troglodytes*), inhabiting Central Africa, from the Gambia to the Congo. It is covered with black hair, and is said to attain a stature superior to that of man. The other species is the Orang-utan, (*Simia Satyrus*), found in the vast islands, and in the farther peninsula, of Eastern India. It is clothed with coarse reddish-brown hair. These animals are so similar, that the same description will, with few exceptions, apply to both. Though these do occasionally assume an erect position when on the ground, their mode of progression is very different from walking; their arms being so long as to reach considerably below the knee, the hands are placed on the ground with a slight inclination of the body, and the animal swings himself forward between the arms, as a lame man does upon his crutches. The great length of arm also helps to maintain their equilibrium when walking, or standing on the topmost boughs of a tree, in which position, it is said, they balance themselves by easy and graceful motions of

\* Its Latin name.

their arms, as a rope-dancer by means of his pole. As far as we are enabled to judge of their characters from immature age, "they appear to be of a grave and gentle disposition, totally free from that petulance and mischievous curiosity which so strongly characterize the Monkeys; very affectionate towards those who treat them kindly, solemn and deliberate in all their actions, extremely circumspect and intelligent, seldom moved to violent passion, but peevish and fretful when crossed or disappointed. They rarely walk on two legs, except when they have occasion to carry something in their fore-hands. Nearly, or altogether deprived of callosities, they do not repose in the manner of ordinary Monkeys, on their hams, but stretch themselves on their sides, like human beings, and support their heads on their hands, or by some other means supply the use of a pillow." In some of the accounts given of the manners of those individuals which have been brought to Europe, there seems a tendency to ascribe to them a greater degree of intelligence than is perhaps their due. A great facility of imitating the actions of men is common to the whole order; but even the docility with which they have submitted to training is not greater than that of the dog, elephant, horse, or even of some of the birds, while in real intelligence they probably yield to the first three. It is not unlikely that all this gentleness and docility would vanish with increasing age, and that their great strength is often exerted at the expense of the weaker denizens of the woods; for,

though they are believed to subsist wholly on fruits, the tusks of old males are as large as those of the lion, and are truly formidable weapons, requiring a hollow in the opposite jaw to receive them when closed.

The Chimpanzee described by Dr. Traill was a young female, about thirty inches high. It was clothed with long black hair, thickest behind and on the head; the ears much resembled the human, but were proportionally broader, and remarkably prominent; the muzzle was large, and much protruded, the face being concave; when the arm was pendent, the phalanges of the fingers, which were three inches long, were below the knee; the thumbs of the forehands were small, but the feet had very long thumbs, and were very powerful; the legs were not destitute of calves, but they had an odd appearance, being nearly of equal thickness down to the heel. This individual had been brought by Captain Payne from the western coast of Africa, where the natives informed him that the species not unfrequently attains the height of five or six feet, proving a formidable antagonist to the elephant, and associating in parties to attack even the lion with stones and clubs. "When our animal came on board," says the captain, "it shook hands with some of the sailors, but refused its hand, with marks of anger, to others, without any apparent cause. It speedily, however, became familiar with the crew, except one boy, to whom it was never reconciled. When the seamen's

mess was brought on deck it was a constant attendant, and would go round and embrace each person, while it uttered loud yells, and then seat itself among them to share the repast. It sometimes expressed its anger by a barking noise like a dog, at others it would cry like a froward child, and scratch itself most vehemently. When any favourite morsels were given to it, sweetmeats especially, it expressed its satisfaction by a sound like 'hem!' in a grave tone. The variety of its tones seems to have been small. It was active and cheerful in warm latitudes, but languor came on as it left the torrid zone; and, on approaching our shores, it manifested a desire for a warm covering, and would roll itself carefully up in a blanket when it went to rest. It generally went on all fours, and never placed the palms of its fore-hands on the ground, but, closing its fists, rested on its knuckles. It did not seem fond of an erect posture, which it rarely assumed, though it could run nimbly on two feet for a short distance. In this case it appeared to aid the motion of its legs by grasping its thighs with its hands. It had great strength in the fingers of the fore-hands; for it would often swing by them on a rope for upwards of an hour without intermission. When first procured, it was so thickly covered with black hair, that the skin of the body and limbs was not visible till the long hair was blown apart. It ate readily every sort of vegetable food, but at first did not appear to relish flesh, though it seemed to take pleasure in

sucking the leg-bone of a fowl. At that time it did not relish wine, but afterwards seemed to like it, though it never could endure ardent spirits. Once it stole a bottle of wine, which it uncorked with its teeth, and immediately began to drink. It showed a predilection for coffee, and was immoderately fond of sweet articles of food. It learned to feed itself with a spoon, drink out of a glass, and showed a disposition to imitate many of the actions of men. It was attracted by bright metals, and seemed to take a pride in clothing, and often put a cocked-hat on its head. It was dirty in its habits, and was never known to wash itself. It lived with Captain Payne seventeen weeks, two of which were spent in Cork and Liverpool. On coming to Liverpool, it languished a few days, moaned heavily, was oppressed in its breathing, and died with convulsive motions of its limbs."\* Bingley states, that Allemand, the Dutch professor of natural history, having received many vague and unsatisfactory accounts respecting an animal of this kind, wrote to Mr. May, a captain in the Dutch naval service, stationed at Surinam. This gentleman had one, which he had brought from Guinea; it was nearly five feet and a half in height, and very strong and powerful. Mr. May had seen him take up his master, a stout man, by the middle, and fling him a pace or two from him; and one day he seized a soldier, who happened to pass carelessly near the tree to which he was chained, and, if his

\* Wernerian Transactions, vol. iii. p. 4.



master had not been present, he would actually have carried the man into the tree. This specimen was at that time twenty-one years old. It died in the succeeding year, having increased in stature in the mean time.\*

In the following account of a young male of this species, by W. J. Broderip, Esq., read before the Zoological Society, Oct. 27th, 1835, its habits, in a state of confinement, are drawn with a graphic power and spirit truly delightful. "The interesting animal whose habits in captivity I attempt to describe, was brought to Bristol in the autumn of this year by Captain Wood, from the Gambia coast. The natives, from whom he received it, stated that they had brought it about one hundred and twenty miles from the interior of the country, and that its age was about twelve months. The mother was with it, and according to their report, stood four feet six inches in height. Her they shot, and so became possessed of her young one; and those who have seen our animal will well understand what Dr. Abel means when, in his painful description of the slaughter of an Asiatic Orang, (*Simia Satyrus*,) he observes, that the gestures of the wounded creature during his mortal sufferings, the human-like expression of his countenance, and the piteous manner of his placing his hands over his wounds, distressed the feelings of

\* An. Biog. vol. i. p. 67 (5th edit.). It is proper to state, however, that more modern naturalists have doubted whether this animal was not a Mandrill, rather than an Orang.

those who aided in his death, and almost made them question the nature of the act they were committing. During the period of his being on ship-board, our Chimpanzee was very lively. He had a free range, frequently ran up the rigging, and showed great affection for those sailors who treated him kindly.

— “ I saw him for the first time on the 14th instant, in the kitchen belonging to the keeper’s apartments. Dressed in a little Guernsey shirt, or banyan jacket, he was sitting, child-like, in the lap of a good old woman, to whom he clung whenever she made a show of putting him down. His aspect was mild and pensive, but that of a little withered old man; and his large eyes, hairless and wrinkled visage, and man-like ears, surmounted by the black hair of his head, rendered the resemblance very striking, notwithstanding the depressed nose and the projecting mouth. He had already become very fond of his good old nurse, and she had evidently become attached to her nursling, though they had been acquainted only three or four days; and it was with difficulty that he permitted her to go away to do her work in another part of the building. In her lap he was perfectly at his ease; and it seemed to me that he considered her as occupying the place of his mother. He was constantly reaching up with his hand to the fold of her neckerchief, though when he did so she checked him, saying, ‘ No, Tommy, you must not pull the pin out.’ When not otherwise occu-



pied, he would sit quietly in her lap, pulling his toes about with his fingers with the same pensive air as a human child exhibits when amusing itself in the same manner. I wished to examine his teeth; and when his nurse, in order to make him open his mouth, threw him back in her arms and tickled him, just as she would have acted towards a child, the caricature was complete.

“I offered him my ungloved hand. He took it mildly in his, with a manner equally exempt from forwardness and fear; examining it with his eyes, and perceiving a ring on one of my fingers, submitted that, and that only, to a very cautious and gentle examination with his teeth, so as not to leave any mark on the ring. I then offered him my other hand with the glove on. This he felt, looked at it, turned it about, and then tried it with his teeth. His sight and his ordinary touch seemed to satisfy him in the case of a natural surface; but, as it appeared to me he required something more to assure his senses when an artificial surface was presented to him, and then he applied the test of his teeth.

“At length it became necessary for his kind nurse to leave him, and, after much remonstrance on his part, she put him on the floor. He would not leave her, however, and walked nearly erect by her side, holding by her gown, just like a child. At last she got him away by offering him a peeled raw potato, which he ate with great relish, holding it in his right hand. His keeper, who is very attentive to him, and

whom he likes very much, then made his appearance, and spoke to him. Tommy (for by that name they call him) evidently made an attempt to speak too, gesticulating as he stood, nearly erect, protruding his lips, and making a hoarse noise, 'hoo-hoo,' somewhat like a deaf and dumb person endeavouring to articulate. He soon showed a disposition to play with me, jumping on his lower extremities opposite to me, like a child, and looking at me with an expression indicating a wish for a game of romps. I confess I complied with his wish, and a capital game of play we had.

“ On another occasion, and when he had become familiar with me, I caused, in the midst of his play, a looking-glass to be brought, and held it before him. His attention was instantly and strongly arrested; from the utmost activity he became immovably fixed, stedfastly gazing at the mirror with eagerness, and something like wonder depicted on his face. He at length looked up at me, then again gazed at the glass. The tips of my fingers appeared at one side as I held it; he put his hands and then his lips to them; then looked behind the glass; then gazed again at its surface; touched my hand again; and then applied his lips and teeth to the surface of the glass; looked behind again, and then returning to gaze, passing his hands behind it, evidently to feel if there was anything substantial there. A savage would have acted much in the same way, judging from the accounts given of such experiments with

the untutored natives of a wild and newly-discovered land.

“ I broke a sugared almond in two, and as he was eating one half, placed the other while he was watching me in a little card-box, which I shut in his presence ; as soon as he had finished the piece of almond which he had, I gave him the box. With his teeth and hands he pulled off the cover, took out the other half, and then laid the box down. He ate the kernel of this almond, rejecting the greatest part of the sugary paste in which it was encased, as if it had been a shell : but he soon found out his error, for, another almond being presented to him, he carefully sucked off the sugar, and left the kernel.

“ I then produced a wine-glass, into which I poured some racy sherry, and further sweetened it with sugar. He watched me with some impatience, and when I gave him the glass he raised it with his hands to his lips, and drank a very little. It was not to his taste, however, for he set down the glass almost as full as he had taken it up, and yet he was thirsty, for I caused a teacup, with some sugared warm milk and water, to be handed to him, and he took up the cup, and drained it to the last drop.

“ I presented him with a cocoa-nut, to the shell of which some of the husk was still adhering : the tender bud was just beginning to push forth ; this he immediately bit off and ate. He then stripped off some of the husk with his teeth, swung it by the knot of adhering husk-fibres round his head, dashed it down,

and repeatedly jumped upon it with all his weight. He afterwards swung it about, and dashed it down with such violence, that, fearing his person might suffer, I had it taken away. A hole was afterwards bored through one of the eyes, and the cocoa-nut was again given to him. He immediately held it up, with the aperture downwards, applied his mouth to it, and sucked away at what milk there was with great glee.

“ As I was making notes with a pencil, he came up, inquisitively looked at the paper and pencil, and then took hold of the latter. Before I gave it up, I drew the pencil into the case, foreseeing that he would submit the pencil-case to examination by the teeth. Immediately that he got it into his possession he put the tip of his little finger to the aperture at the bottom, and, having looked at it, tried the case with his teeth.

“ While his attention was otherwise directed, I had caused a hamper containing one of the *Pythons* [great serpents] to be brought into the room, and placed on a chair not far from the kitchen-dresser. The lid was raised, the blanket in which the snake was enveloped was opened, and soon after Tommy came gamboling that way. As he jumped and danced along the dresser, towards the basket, he was all gaiety and life. Suddenly he seemed to be taken aback, stopped, then cautiously advanced towards the basket, peered, or rather *craned* over it, and instantly, with a gesture of horror and aversion, and the cry of

‘Hoo! hoo!’ recoiled from the detested object, jumped back as far as he could, and then sprang to his keeper for protection. He was again put down, his attention diverted from the basket, and after a while tempted to its neighbourhood by the display of a fine, rosy-cheeked apple, which was at last held on the opposite rim of the hamper. But, no! he would evidently have done a good deal to get at the apple; but the gulf wherein the serpent lay was to be passed, and, after some slight contention between hunger and horror, off he went, and hid himself. I then covered up the snake, and, after luring him out with the apple, placed it on the blanket. No! I then shut down the lid; still the same desire and the same aversion. I then had the hamper, with the lid down, removed from the chair on which it had been placed to another part of the room. The apple was again shown to Tommy, and placed on the lid. He advanced cautiously, looking back at the empty chair, and then at the hamper: he advanced further with evident reluctance, but, when he approached near, he peered forward toward the basket, and, as if overcome by fright, again ran back, and hid himself under his cage.

“I now caused the hamper with the serpent to be taken out of the room. Our friend soon came forward. I showed him the apple, and placed it on the chair. He advanced a little, and I patted his head and encouraged him. He then came forth, and went about the room, looking carefully, as if to satisfy

himself that the snake was gone; advanced to the chair more boldly; looked under it, and took the apple, and ate it with great appetite, dancing about, and resuming all his former gaiety.

“We know that there are large constricting serpents in Africa; and, as the animal must have been very young when separated from its parents, I made this experiment in particular to try his instinct: it succeeded, to the entire satisfaction of the witnesses who were present.

“He manifested aversion to a small living Tortoise, but nothing like the horror which he betrayed at sight of the snake. I was induced to show him the former by the account of the effect produced by *Tes-tudinata* on the Asiatic *Orang*, whose habits are so admirably described by Dr. Abel and Captain Methuen, who brought the animal to England.

“Tommy, among other exercises, is very fond of swinging. He places himself on the swing, generally in a sitting posture, holding on each side with his hands. He not unfrequently puts up his feet, and grasps the cord on either side with them too, appearing more at home on his slack rope than Il Diavolo Antonio himself.

“James Hunt, one of the keepers, has observed him frequently sitting and leaning his head on his hand, attentively looking at the keepers when at their supper, and watching, to use Hunt's expression, ‘every bit they put into their mouths.’ Fuller, the head-keeper, informs me that our Chimpanzee



generally takes his rest in a sitting posture, leaning rather forward, with folded arms, and sometimes with his face in his hands. Sometimes he sleeps prone, with his legs rather drawn up, and his head resting on his arms.

“ Of the black *Orangs* which I have seen, Tommy is by far the most lively. He is in the best health and spirits, and is a very different animal from the drooping, sickly Chimpanzees that I have hitherto seen. A good deal of observation made on the Asiatic *Orangs* which have been exhibited in this country, satisfies me that the intelligence of the African *Orang* is superior to that of the Asiatic. This intelligence is entirely different from that of a well-educated dog, or a mere mimic, and gives me the idea of an intellect more resembling that of a human being than of any other animal, though still infinitely below it.

“ The *Pigmy* of Tyson, and the *Black Orang* dissected by Dr. Traill, and so well described by him in the ‘Wernerian Transactions,’ are both stated to have progressed generally by placing their bent fists on the ground, and so advancing : indeed, Dr. Traill says, that the individual which he saw never placed the palms of the hands on the ground. The progression of Dr. Abel’s *Red*, or *Asiatic Orang*, is described to have been after the same fashion. Whether it is that our *Chimpanzee* is in better health and more lively, I know not, but he certainly passes a great deal of his time in a position nearly approaching to

erect; nor does he, generally, place the bent knuckles to the ground. He will often stand on the top of his cage, and apply the palms of his hands to the smooth surface of the wall against which it stands. It is said that a spectator who saw him thus employed, with his back to the company, dressed in his little banyan jacket and woollen cap, was told by a companion to look at the monkey, as he profanely called him. ‘Where is he?’ was the reply. ‘Why, there, on the top of the cage,’ was the answer. ‘What!’ said the first, ‘that little man who is plastering the wall?’

“Tommy does not like confinement; and, when he is shut into his cage, the violence with which he pulls at and shakes the door is very great, and shows considerable strength; but I have never seen him use this exertion against any other part of the cage, though his keeper has endeavoured to induce him to do so, in order to see whether he would make the distinction. When at liberty, he is extremely playful; and in his high jinks I saw him toddle into a corner where an unlucky bitch was lying with a litter of very young pups, and lay hold of one of them, till the snarling of the mother, and the voice of his keeper, to which he pays instant respect, made him put the pup down. He then climbed up to the top of the cage, where the *Marmozets* were, and jumped furiously upon it, evidently to astonish the inmates; who were astonished accordingly, and huddled together, looking up in consternation at this ‘dreadful



pothor o'er their heads.' Then he went to a window, opened it, and looked out. I was afraid that he might make his escape; but the words 'Tommy, no!' pronounced by his keeper in a mild but firm tone, caused him to shut the window and come away. He is, in truth, a most docile and affectionate animal, and it is impossible not to be taken by the expressive gestures and looks with which he courts your good opinion, and throws himself upon you for protection against annoyance.

"It must be remembered, that though I have not observed our Chimpanzee to progress with his bent knuckles touching the ground, as I have seen the Asiatic *Orangs* move, there is no reason for doubting the accurate descriptions of Tyson and Dr. Traill. I consider it as my province to relate faithfully what I saw, and I have only seen our Chimpanzee, as yet, in a small room, where a very few paces will bring him to a chair, a leg of a dresser, or some other piece of furniture, which enables him to call into action his prehensile hands and feet, so admirably adapted to his arboreal habits.

"Since writing the above, the cage in which our animal was confined has been enlarged, and several barked branches have been nailed to a stem, so as to form an artificial tree. These branches he ascends with great activity, and frequently swings with his head downwards, holding on by his lower extremities, and recovering himself with greater agility than any rope-dancer."\*

\* Proc. Zool. Soc. 1835, p. 160.

The earliest detailed account of the Orang-utan that we possess is given by Vosmaer, of one brought to Holland in 1776, and presented to the menagerie of the Prince of Orange.

“ This animal was in height about two Rhenish feet and a half, of a chestnut colour. It showed no symptoms of fierceness or malignity, and was even of a melancholy appearance. It was fond of being in company, and showed a preference for those who took daily care of it, of which it seemed to be very sensible. Often when they retired it would throw itself on the ground as if in despair, uttering lamentable cries. Its keeper having been accustomed sometimes to sit near it on the ground, it would take the hay of its bed, and spreading it in the form of a cushion or seat, invite, by every demonstration, its keeper to sit with it. Its usual manner of walking was on all fours, but it could also walk on its two hind feet. One morning it got unchained, and we beheld it with wonderful agility ascend the beams and rafters of the building; it was not without some trouble that it was taken, and we then remarked the prodigious strength of the animal; the assistance of four men being necessary, in order to hold it in such a manner as to be properly secured. During its state of liberty, it had, among other things, taken the cork from a bottle of Malaga wine, which it had drunk to the last drop, and had set the bottle in its place again. When presented with strawberries on a plate, of which it was extremely fond, it was very amusing to see it take them up one by one with

a fork and put them into its mouth. Its common drink was water, but it also willingly drank all sorts of wine, preferring Malaga. After eating it always wiped its mouth, and when presented with a tooth-pick, always used it in a proper manner. (!) This animal lived seven months in Holland, whither it had been sent from the island of Borneo."

The following account from Dr. Clarke Abel, of one which lived some time in his possession, is additionally interesting from the circumstance of the observations having been made upon it in its own climate, while enjoying a state of comparative liberty. "Whilst at Java," says Dr. Abel, "he lodged in a large tamarind tree near my dwelling, and formed a bed by intertwining the small branches, and covering them with leaves. During the day he would lie with his head projecting beyond his nest, watching whoever might pass under, and when he saw any one with fruit, he would descend to obtain a share of it. He always retired for the night at sun-set, or sooner if he had been well fed; rose with the sun, and visited those from whom he habitually received food. On board ship he commonly slept at the mast-head, often wrapping himself up in a sail. Sometimes I preoccupied his bed, and teased him by refusing to give it up. On these occasions he would endeavour to pull the sail from under me, or force me to quit it, and would not rest until I resigned it. If all the sails happened to be set, he would hunt about for some other covering, and either steal one of the sailor's jackets, or empty a hammock of its blankets.

His favourite amusement in Java was swinging from the branches of the trees, or climbing over the roofs of the houses ; on board, in hanging by the ropes, or romping with the boys of the ship. He would entice them to play by striking them with his hand as they passed, and then bounding from them, but allowing them to overtake him, and then engage in a mock scuffle, in which he used his hands, feet, and mouth. If any conjecture could be formed from these frolics of his mode of attacking an adversary, it would appear to be his first object to throw him down, then secure him with his hands and feet, and then wound him with his teeth. Of some small Monkeys on board, he took little notice, whilst under the observation of the persons of the ship. Once, indeed, he openly attempted to throw a small cage containing three of them overboard ; but I had reason to believe that he was not so indifferent to their society when free from observation. On one occasion I observed him lying on his back, partially covered with a sail, contemplating with great gravity the gambols of a young Monkey, which was bounding over him ; at length he caught him by the tail, and tried to envelope him in the covering. The Monkey seemed to dislike the confinement, and broke from him, but again renewed his gambols, and though repeatedly caught, always escaped. The intercourse, however, did not seem that of equals, for the Orang-utan never condescended to romp with the Monkeys as he did with the boys of the ship. Yet the Monkeys had evidently a great predilection for

his company, for whenever they broke loose, they took their way to his resting-place. But though so gentle when not exceedingly irritated, the Orangutan could be excited to violent rage, and on one or two occasions committed an act which, in a rational being, would have been called the threatening of suicide. If repeatedly refused an orange, when he attempted to take it, he would shriek violently, and swing furiously about the ropes, then return and endeavour to obtain it; if again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams, and then suddenly starting up, rush furiously over the side of the ship and disappear. On first witnessing this, we thought that he had thrown himself into the sea, but on searching found him concealed under the chains.\*

“I have seen him exhibit violent alarm on two occasions only, when he appeared to seek for safety in gaining as high an elevation as possible. On seeing eight large turtles brought on board off the Isle of Ascension, he climbed with all possible speed to a higher part of the ship than he had ever before reached, and looking down upon them projected his long lips into the form of a hog’s snout, uttering at the same time a sound which might be described as between the croaking of a frog, and the grunting of a pig. After some time he ventured to descend, but with great caution, peeping continually at the turtles,

\* Pieces of timber projecting from the side of a ship, to which are fastened the shrouds, &c.

but could not be induced to approach within many yards of them. He ran to the same height, and uttered the same sounds on seeing some men bathing and splashing in the sea, and since his arrival in England has shown nearly the same degree of fear, at the sight of a live tortoise.”\*

The same writer has given a very interesting narrative of the capture of an adult Orang-utan, which was of gigantic proportions. This animal was discovered by the boat's crew of a merchant ship, at a place called Ramboom near Touraman, on the north-west coast of Sumatra, on a spot where there were a few trees on a piece of cultivated ground. It was evident that he had come from a distance, for his legs were covered with mud up to the knees, and the natives were entirely unacquainted with him. On the approach of the boat's crew, he came down from the tree in which he was discovered, and made for a clump at some distance, exhibiting as he moved the appearance of a tall, man-like figure, covered with shining brown hair, walking erect, with a waddling gait, but sometimes accelerating his motion with his hands, and occasionally impelling himself forward by the bough of a tree. His motion on the ground was evidently not his natural mode of progression, for even when assisted by his hands, or a stick, it was slow and vacillating; it was necessary to see him amongst the trees to estimate his strength and agility. On being driven to a small clump he gained by one spring a very lofty branch, and bound-

\* “Narrative of a Journey in China,” &c., p. 325.



ed from one branch to another with the swiftness of a common monkey. Had the country been covered with wood, it would have been almost impossible to prevent his escape, as his mode of travelling from one tree to another was as rapid as the progress of a swift horse. Even amidst the few trees that were on the spot his movements were so quick that it was very difficult to obtain a settled aim; and it was only by cutting down one tree after another, that his pursuers, by confining him within a very limited range, were enabled to destroy him by several successive shots. Having received five balls his exertions relaxed, and reclining exhausted against a branch, he vomited a quantity of blood. The ammunition of the hunters being by this time exhausted, they were obliged to fell the tree in order to obtain him; but what was their surprise to see him, as the tree was falling, effect his retreat to another, with seemingly undiminished vigour! In fact they were compelled to cut down all the trees before they could force him to combat his enemies on the ground; and when finally overpowered by numbers, and nearly in a dying state, he seized a spear made of a supple wood, which would have withstood the strength of the stoutest man, and, in the words of the narrator, broke it "like a carrot." It was stated by those who aided in his death, that the human-like expression of his countenance, and his piteous manner of placing his hands over his wounds, distressed their feelings so as almost to make them question the nature of the act they were

committing. He was *more than seven feet high*, with a broad expanded chest, and narrow waist. His chin was fringed with a beard, that curled neatly on each side, and formed an ornamental, rather than frightful appendage to his visage. His arms were long even in proportion to his height, but his legs were much shorter. Upon the whole he was a wonderful beast to behold, and there was more about him to excite amazement than fear. His hair was smooth and glossy, and his whole appearance shewed him to be in the full vigour of youth and strength. This specimen is preserved in the Museum of the Asiatic Society.\*

Proceeding from the Orangs, we arrive at the genus

*Hylobates*,† *the Gibbon*.

These approximate to the Monkeys, by the naked callosities on the rump, but the absence of both tail and cheek-pouches shews their affinity to the preceding. Their most remarkable peculiarity is the exceeding length of their arms. They all inhabit the East Indian Islands.

The Siamang, (*H. Syndactyla*,‡) was first discovered by Sir Stamford Raffles, to whom science is so deeply indebted. The second and third toes of the hind foot, or, considering it as a hand, the fore and

\* Asiatic Researches, vol. xv. p. 490.

† Ὕλη, *hyle*, a wood, and βαίνω, *baino*, to go.

‡ Σύν, *syn*, together, and δάκτυλος, *daktylos*, a finger.



middle finger, are united as far as the nail joint by a membrane. The skull is small and flattened, the eyes deep sunk, the nose flat with wide nostrils, the gape of the mouth nearly as wide as that of the jaws, almost literally "from ear to ear." The ears are scarcely apparent. It is covered with long, glossy, black hair, except on the face and the breasts of the female, which are naked, but black. Under the throat are two folds of skin, forming a sac connected with the windpipe, which it has the power of inflating when it cries, and by means of which its terrific voice is said to be audible for several miles. In Sumatra, the Siamangs assemble in large troops, led according to report, by vigilant and bold chiefs, which at sunrise and sunset fill the forests with their frightful cries. During the day, however, unless disturbed, they repose in profound silence. When surprised on the ground, they are easily caught, as their motion is slow and difficult; contrary to the usual habits of the order, a wounded individual is abandoned to his fate, unless it be a young one, when maternal affection, often beautifully manifest where else there is little that is amiable, prevails over personal safety. It is said that the parental care of their young extends to actions which we should hardly look for; even washing, rubbing and drying them in spite of the pettish cries of the sable infant, with a business-like gravity that is highly ludicrous and amusing. Duvaucel affirms that though easily reconciled to confinement, its tameness is that of apathy: indifferent even to its food, it allows it

to be taken away without any signs of displeasure or attempts at resistance.\* It usually drinks by dipping the long fingers into water and sucking them.

The Wouwou, (*H. Agilis*), is of very different habits. In form it is much like the preceding, but of less size; its height when erect being three feet. In its native woods it springs from tree to tree with wonderful agility, and is rarely taken alive. In captivity it is much less lively, but has not the apathy imputed to the Siamang. In both species, such is the length of the arms that the fingers touch the ground when the animal stands erect.

The Monkeys, properly so called, constituting the genera *Cercopithecus*,† *Semnopithecus*, *Macacus*, &c., are too familiarly known to need much description. Generally they are of small size, have a muzzle more prominent than the Apes, callosities on the rump, cheek-pouches, and a long tail. They abound in the tropical countries of the Old World, inhabiting the trees in large companies; they feed on fruits, to obtain which they often plunder fields and gardens. The species are exceedingly numerous, and in captivity their surprising agility, prying curiosity, odd grimaces, and mischievous pranks, have rendered them the mountebanks of the animal world.

\* Raffles and Bennett, however, give much more favourable reports of its manners: the latter gentleman has recorded many interesting particulars of one which he was endeavouring to bring to England.

† *Κέρκος*, *kernos*, a tail, and *πίθηκος*, *pithekos*, an ape. *Σεμνός*, *semnos*, venerated; *Macaco*, a negro word.

These are represented in America by a great multitude of species, called Spider Monkeys, or Sapajous, and Sakis, arranged under the genera *Cebus*,\* *Ateles*, *Callithrix*, &c. They are distinguished by an additional molar tooth in each jaw, possessing thirty-six teeth in all, whereas the *Quadrumana* hitherto spoken of, have but thirty-two, as in Man. They have no callosities, and no cheek-pouches; the tail is long, and, in a large number of species, prehensile; the tip being capable of twisting round a branch or similar projection so firmly as to support the weight of the body, answering the purpose of a fifth hand. Their voice is often loud and wailing, whence they are sometimes designated Howling Monkeys. The flesh is eaten, and is said by Mr. Waterton to be palatable.

We now come to a tribe which, of all the typical *Quadrumana*, is the most brutal both in form and manners. It is the genus

*Cynocephalus*,† the *Baboon*.

These are large animals, which, instead of the small flattened nose of the Apes, have it prolonged into a great muzzle, terminating abruptly, much resembling that of a dog. They have cheek-pouches and callosities, and a comparatively short tail, often erected. They inhabit Africa and India; where spe-

\* Κῆπος, *kepos*, a monkey described by Ælian. Ἀτελής, *ateles*, imperfect, being without a thumb. Καλός, *kalos*, beautiful, and θρίξ, *thrix*, hair.

† Κύων, *kyon*, a dog, and κεφαλή, *kephale*, the head.

cimens occasionally seen in the woods probably originated the Satyrs of ancient fable. When full grown, they are frightfully ferocious and brutal. One of the most remarkable of the eight or ten species included in this genus, is the Mandrill (*C. Mormon*); it is also the largest, attaining the size of man. The enormous protuberance of its cheeks, the great head destitute of a forehead, the prominent brows overhanging the little sunken eyes, give it an aspect of horrible ferocity. The brilliant colours lavished on it serve only to make its appearance still more revolting. The callosities are large, and deep scarlet, and the great cheeks are singularly marked with ribs of azure, scarlet, and purple. The general colour is light olive, and it has a yellow beard. Its thick and robust body, its short and muscular limbs, give it a prodigious strength, and render it a most formidable animal. In confinement it is mischievous, morose, and savage; and its strong predilection for spirituous liquors is by no means a redeeming trait in its character. "A very fine one, which was some time at Exeter Change, and afterwards at the Surrey Zoological Gardens, drank his pot of porter daily, and evidently enjoyed it; it was a most amusing sight to see him seated in his little arm-chair, with his quart pot beside him, smoking his short pipe with all the gravity of a Dutchman." In a wild state these animals resort to the villages during the absence of the men, plunder the fields and houses of food, and even carry away the negro women. It

is affirmed that they scruple not to attack the lordly lion and elephant, and drive them away from their quarters.

We have hitherto found a visible resemblance to the human form, but in the genus

*Lemur,\* the Lemur,*

we perceive this likeness fading away, and while they possess the true hands and some of the habits of the Monkeys, their form is evidently that of the beast. The distinguishing characters consist chiefly in the number and position of the teeth; which are, six incisors beneath, slanting forward; four above, in pairs; canines sharp and conical; six molars in each jaw, which begin to exhibit sharp tubercles, catching in each other as in the Insectivora. The first finger of the hind hands has a short curved claw, while all the other nails are flat. The muzzle is long and pointed, like that of a fox. The tail in some is long and very hairy, in others it is wanting. The fur is thick and bushy. All the species are natives of Madagascar, where they replace the true Monkeys, of which they appear to possess the agility and familiarity, without their mischief or grimace. They feed partly on fruits, but partly, also, on small birds and insects. Their activity is manifested during the night only.

There is yet another genus, which, though placed

\* *Lemures*, among the Romans signified nocturnal ghosts.

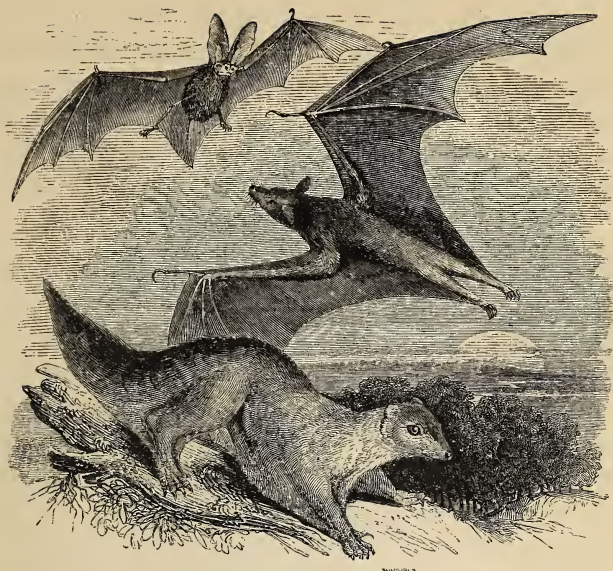
by Cuvier after the Bats seems properly to belong to the Quadrumana, and to be the link which connects the two together. It is

*Galeopithecus,\* the Flying Lemur.*

Mr. Swainson observes of it, “to give its most striking character in a few words, it is a Lemur, with the limbs connected by a bat-like membrane, or surrounded by a thin skin which they support, as the frame-work of an umbrella supports its covering. By this singular structure the animal is supported in the air, but without the power, like the Bats, of sustaining a continued flight.” Like them, however, it appears that they are nocturnal animals, feeding on insects; and they possess the same habit of suspending themselves by the hind claws with the head downwards during repose. Two species are recognised—*G. Temminckii*, and *G. Philippinensis*, both inhabitants of the Indian Archipelago.

\* Γαλῆν, *gale*, a weasel, and πίθηκος, *pithecos*, an ape.





FLYING LEMUR (*Galeopithecus Philippinensis*), KALONG (*Pteropus Javanicus*), and LONG-EARED BAT (*Plecotus Auritus*).

### ORDER III.—CARNARIA.\*

THIS is an extensive order, comprising animals of great diversity of size, structure, and function. They possess all the three kinds of teeth—incisors, canines, and molars; the toes are free, terminated by claws, but the thumb is no longer opposable to the others. They subsist on animal food, more or less exclusively. Those which have the molar teeth studded with tubercles, as some of the Bats, feed on fruits principally; those in which they are armed

\* *Caro*, flesh.

with conical points, feed chiefly on insects; while those in which they are quite trenchant, are exclusively flesh-eaters, their food being the flesh of other *vertebrata*. The lower jaw has merely a vertical motion, the joint being like a hinge. Cuvier divides them into three sub-orders, the first being the

SUB-ORDER I.—CHEIROPTERA.\*

This is a strongly-marked and very distinguishable group of animals, recognised by the single character of a membranous extension of the skin, commencing at the neck, enveloping the arm and hand, and proceeding thence to the hind limbs, and in most species even to the end of the tail. For the purpose of expanding this membrane, the four fingers of the anterior limbs are enormously lengthened, resembling the ribs of an umbrella, and with this apparatus the animal is enabled to perform a sustained and perfect flight, resembling more the flitting of a butterfly, however, than the flight of a bird, but possessing great celerity of motion. Extremely delicate and supple, this membrane is capable of being contracted into innumerable wrinkles, so that when the animal folds its long fingers together upon the arm, and brings the arm close to the side, we are astonished to observe into how small a space the long and broad wings are compressed. The thumb of the fore feet, however, is free, and being furnished with a sharp hooked claw, affords aid to the Bat in its somewhat awkward attempts at progression on

\* *Χεῖρ*, *cheir*, a hand, and *πτερόν*, *pteron*, a wing.



the ground, or in the performance of a much cleverer feat, the running nimbly up a perpendicular surface. In walking, the wings being closed, “the animal rests upon the wrist. The foot of one side is then extended forward, and the thumb-nail is hooked into the ground; the body is next raised by means of the hinder foot, which has been placed partly under the body, and thus thrown forward; the other side is next propelled in the same manner; it is therefore by a succession of these plunges that their progression on the ground is effected, which is sometimes sufficiently rapid to deserve the name of running. This action, it must be acknowledged, is but a ludicrous attempt compared with the progression of other quadrupeds, but it is sufficient for their wants; and it cannot be too strongly urged that the apparently imperfect and abortive means of terrestrial progression given to the Bat and the Sloth, are as indicative of infinite wisdom as the power of the Lion, or the fleetness of the Antelope, because it is equally fitted to their requirements.”\*

Notwithstanding their dissimilarity in appearance, the elongation of the arm and hand, the number, form, and position of the teeth, the situation of the mammæ, and other characters indicate their affinity to the *Quadrumana*, so that they were not without reason placed by Linnæus in the same order as Man; which he named *Primates*.

Of the great foreign species, respecting which so many idle tales have been related, we know very

\* Bell's Brit. Quad. p. 6.

little that can be depended on. It is generally believed that the power attributed to them (*Pteropus Vulgaris*, *Vampirus Spectrum*, &c.) of sucking the blood of the larger animals, has been grossly exaggerated, though it is probably not altogether fabulous. It seems, however, that though generally frugivorous, they occasionally prey on insects and small birds.

The Kalong, (*Pteropus\** *Javanicus*,) has a body as large as a small cat, and its wings expand five feet. It is abundant in Java, where it is gregarious. Multitudes of them, selecting a large tree, hang suspended during the day by the hind claws, presenting a singular spectacle, appearing like appendages to the tree, or strange fruit. If disturbed from repose during day, they make awkward attempts to escape, uttering piercing shrieks; as the claws being exceedingly sharp, they cannot readily disengage themselves without preparation. They do great mischief by trooping down upon the orchards and gardens, devouring all the fruit. In serene nights, it is a favourite amusement to pursue them, for they are easily watched to the fruit-trees, and then shot down. The flesh is esteemed by the natives.

Of the timid little insectivorous Bats, forming the genera *Vespertilio*, *Rhinolophus*,† &c., our own country possesses nearly twenty species. Associated with the balmy sweetness of the summer evening, flitting around us in our pleasant twilight walks, through shady lanes, or over the broad river, they possess

\* Πτερόν, *pteron*, a wing, and πούς, *pous*, a foot.

† *Vesper*, the evening, 'Ρίη, *rhin*, the nose, and λόφος, *lophos*, a crest.

an interest independent of that arising from their singular conformation. We have two species, (*V. Noctula*, and *V. Murinus*,) whose expanded wings measure fifteen inches, while of others, the expansion is little more than five or six. All are strictly nocturnal; remaining during the day in obscure recesses, suspended by the hind feet, but trooping forth in the dusk of evening to pursue the night-flying insects, chiefly moths. Of these they devour great numbers, and the severed wings of fine insects may often be seen lying on the ground, snipped off and rejected by the Bats. The notion that they cannot rise to flight from the earth is without foundation, as, in captivity, nothing is more common than to see them spring at once to flight from the floor of a room. The female Bat generally brings forth a single young one, which is received into the membrane, the tail being curved upwards so as to form a nest, and afterwards carefully wrapped up in the wings while sucking; and it has been asserted that she can even fly with the young adhering to the breast. Some species have an extraordinary development of the ears, which stand up from the head like large hollow shells, occasionally falling down into elegant curves and folds; they are delicately transparent, and are folded beneath the arms during repose. These form the genus *Plecotus*.\* Others, again, have a still more remarkable conformation of the nose, which is surrounded by a membranous appendage, taking the most singular shapes. These are the Horse-shoe Bats, (*Rhinolophus*.)

\* Πλέκω, *pleko*, to fold, and ὠτα, *ota* the ears.

THE MOLE (*Talpa Vulgaris*).

## SUB-ORDER II.—INSECTIVORA.\*

This group comprises a few familiar animals of small size, usually nocturnal, and more or less subterranean. Such as inhabit cold climates usually pass the winter in a state of lethargy. Their feet are short, and in walking the whole sole is placed on the ground. The number and position of the teeth differ in the different genera, but all have grinders with conical points. The Hedgehog, (*Erinaceus*), so well defended by its coat of spines, the Shrews, (*Sorex*), the victims of absurd superstition, and the Mole, (*Talpa*), “that runneth underneath,” belong to this family. The last, however, (*Talpa Vulgaris*), demands a rather more extended notice, as well on

\* *Insectum*, an insect, and *voro*, to devour.

account of its singular habits, as of the wisdom and providential care displayed in its formation. It is destined to live beneath the surface of the earth, in which it forms long cylindrical burrows, diverging from a central fortress of most elaborate construction. Through these it pursues its natural prey, the earthworm, and subterraneous larvæ of insects, and they are consequently traversed many times a day as a beaten road; they form, too, so many retreats in case of surprise; and heavy, dull, and awkward as it looks above ground, the Mole can rush through these subterranean galleries with a speed equal to that of a horse at full trot. As, however, the prey of one neighbourhood is soon exhausted, the Mole is compelled continually to extend his operations, or seek a new district and form a new encampment. This necessity imposes on the animal incessant toil, and, to our notions, toil of the most sordid and laborious character, so that we are tempted to pity it, as one which God has condemned to the life of a slave in the mines, and to which all sources of pleasure are denied. We should judge very rashly, however, were we to form this decision, and suppose that because *we* should be uncomfortable and miserable in such circumstances, *the Mole* is really unhappy. Its whole construction admirably adapts it for its mode of life; its body is almost cylindrical, covered with the softest fur, like velvet, which, lying in any direction with equal smoothness, offers no resistance in passing through the earth backward or forward, and forms an almost impervious protection

against cold ; its nose is long and pointed, to bore its passages, and its limbs are short, and of amazing strength. But it is in the paws of the fore-feet, the hands as they may well be termed, that the beneficent wisdom of the great Creator is abundantly manifested.

The bones of these extremities are short, and of peculiar form ; the toes are almost inflexible, so that the paw, or hand, can be only partially closed ; they are furnished with stout and long nails, hollow beneath, which serve as gouges in digging away the soil. The palms are turned outwards, and their only motion is in a backward direction, and thus the Mole is enabled to throw the earth, which it so rapidly excavates, behind its body as it advances.

The Mole is not absolutely blind, though its eyes are but little developed, as, indeed, they would be in its usual circumstances quite useless ; the sense of hearing is acute, and that of smell perhaps still more so. The fur, from its velvety softness, rich black hue, and play of light, is very beautiful ; but there is an Asiatic species allied to it, which far exceeds it in beauty. It is the Golden Mole, (*Chrysochloris*\* *Asiaticus*,) whose fur possesses those splendid, changeable, metallic gleams, which so frequently adorn birds and insects, but are not found in any other quadruped. The general hue is golden green, changing to that of burnished copper or bronze.

\* *Χρυσός*, *chrysos*, gold, and *χλωρός*, *chloros*, green.





THE BROWN BEAR (*Ursus Arctos*), FOX (*Vulpes Vulgaris*), and JAGUA (*Felis Onca*).

SUB-ORDER III.—CARNIVORA.\*

While the preceding genera of this Order are compelled to satisfy their appetite for flesh with that of invertebrate animals, such as insects and worms, partly from the want of cutting edges to their teeth,

\* *Caro*, flesh, and *voro*, to devour.



and partly from their weakness, those of the present group possess with the sanguinary appetite for flesh, the force necessary to obtain it. They have four large and sharp canines, usually called tusks, and six incisors in each jaw; the molars must be described more particularly. The molars next to the canines are the most trenchant, and are named false molars; next comes a molar larger than the rest, called a *lacerator*, usually furnished with a tuberculous heel; and behind it, one or two small teeth that are quite flat, called tuberculous teeth. As the power of eating flesh is dependent on the trenchant character of the teeth, the nature of their diet may be readily seen by observing the proportion which the tubercled surface bears to that portion which has a cutting power. Those genera which have the fewest false molars, and the shortest jaws, are the most exclusively carnivorous.

There is also a great difference in the manner of walking. Some genera, like all those we have yet considered, place the whole sole of the foot to the ground, from the heel to the toes. But the greater number, raising the heel, walk only on the toes, and in these the greater part of the sole is covered with hair. These are swifter than the former; and it is a curious circumstance that when *man* runs swiftly, he does not put his heel to the ground at all. To the former of these divisions has been applied the term *Plantigrade*, to the latter *Digitigrade*.\*

\* *Planta*, the sole, and *gradior*, to step; *digitus*, a finger or toe.

## I. PLANTIGRADA.

*Ursus*,\* the Bear.

Linnæus united all the plantigrades into this genus, but modern zoologists have separated from it the Raccoon, (*Procyon*,)† the Coati, (*Nasua*,)‡ the Badger, (*Meles*,)§ the Glutton, (*Gulo*,)§ and one or two others.

The true Bears have nearly all their teeth tuberculated, in accordance with which their diet can be almost wholly vegetable, and several of them rarely eat flesh except from necessity. They are large stout-bodied animals, with thick limbs, and a short tail. They excavate dens, in which they pass the winter in a state of lethargy, and without food. Their heavy clumsy proportions, and their thick shaggy coat, indicate the sleepiness and stupidity of their habits, which are combined, however, with a great deal of brute strength. Wanting the cunning and agility of the Cats, the swiftness and perseverance of the Dogs, and the insinuating worm-like slenderness of the Weasels, they are in general little calculated to pursue living prey; the carnivorous structure is at its lowest point of developement. And yet there is a consecutive gradation from this point to its maximum in the Cats, as we shall presently perceive.

\* Its Latin name.

† Πρὸ, *pro*, before, and κύων, *kyon*, a dog.

‡ *Nasus*, a nose.

§ Latin names.

Linnaeus was acquainted with but a single species of this genus, the common Brown Bear, (*Ursus Arctos*,) but since his time more than a dozen have been made known. Of these two are from North and one from South America, five or six from India, one from Syria, one from the Polar Regions, and two or three are European.



THE POLAR BEAR (*Ursus Maritimus*).

The Polar Bear, (*Ursus Maritimus*,) differs much in its general contour from the rest of the tribe. The head is broad and flattened, the fore parts of the body slender, the fur finer and smoother, and the whole animal much elongated. It will readily be seen how much this conformation adapts it for

rapid motion in the water, which may justly be called its home. Navigating the dreary waters of the Frozen Ocean, the Polar Bear may often be seen, a solitary voyager, on one of the fantastic icebergs that frown on those cheerless wastes. More carnivorous than most of its congeners, it watches for the floating carcasses of whales and seals; on which it subsists if possible, but in case of necessity it will pursue living seals, or even the arrowy tribes of fishes; and as an instance of its skill and speed in this latter pursuit, Cartwright records having seen one catch a salmon by diving after it. Its size, strength, and ferocity, have been very much over-rated; from the narratives of the earlier navigators it was considered as scarcely less formidable than the Lion; and some talk of it as exceeding twenty feet in length. In fact, it is but little larger than the common Brown Bear, and perhaps not more ferocious, excepting inasmuch as it may be rendered savage by the greater frequency of hunger. In colour it is white, with a yellowish tinge in parts; which is also the colour of a species recently discovered in Mount Lebanon, the Syrian Bear, (*U. Syriacus*), probably the Bear so often mentioned in the Old Testament.

The most formidable of the genus appears to be the Grizzly Bear, (*U. Ferox*), a denizen of the Rocky Mountains in North America. He is twice as large as the common Bear, his fur is blackish, grizzled with grey, his feet and claws are of immense size. The latter are indeed terrific weapons, long, sharp,

and much curved, like those of the great Cats. He is amazingly strong, and his courage is proportioned to his strength. He attacks and overcomes the gigantic Bison, and even drags away the carcase to bury it. Far from fearing man, he seems to scorn even the stealthy manœuvring of the Lion and Tiger, rearing on his broad hind feet at the first sight of his adversary, and rushing down upon him with fearless violence. He is not only dangerous on account of his strength and courage, but also from his tenacity of life. Lewis and Clarke state that there is no chance of killing him by a single shot, unless the ball go directly through the brain. They record an instance in which a Bear having received five shots through his lungs, and five other wounds in his body, swam a considerable distance, and lived twenty minutes. In another instance, one that had been shot through the centre of the lungs, pursued his assailant half a mile, returned more than a mile, dug himself a bed in the earth, and was alive two hours afterwards; and a third, though shot actually through the heart, ran a quarter of a mile before he fell. Many stirring narrations have been given by the enterprising officers above-named and others, of encounters with the Grizzly Bear: but the following, of recent occurrence, may not be unacceptable.

“In June, 1833, as a party of hunters were preparing to encamp under a bluff on the banks of the Arkansaw, one of their dogs upon going round a ledge of rocks, began to bark loudly. As they were in the vicinity of large game, they seized their guns;

and upon coming to the spot saw two monstrous Grizzly Bears up in the tree-tops, and one on the ground, besides one which was looking out of a cave in the rocks. Concealing themselves by a small eminence, they were able to approach within forty paces unperceived. Two of the hunters fired at the nearest, and killed him. One man ascended the eminence, and fired at one of the large bears in the tree, and broke his shoulder; but this did not prevent his jumping down and giving him chase. The hunter sprang instantly behind a tree, and just had time to reload, when the animal came up to him, gnashing his teeth, and walking erect, standing as high as his head. He levelled his gun at the creature, actually within reach of the muzzle, and put a ball through its heart, but in its dying agonies the hunter got badly wounded.

“Another man ascended the lower branch of a gigantic sycamore, but before he had time to level his piece the bear sprang from the top on to him, and with one blow of his paw killed him. Both came to the ground together; the bear sprang up and ran furiously with open mouth upon two of the hunters who had not fired. They fired instantly and ran. He gained upon them so fast that they threw aside their guns and pouches, and jumped from a perpendicular bank twenty feet high, into the river, and the bear after them. He was very near the hindmost man, when one of the hunters on the bank shot him through the head. After reloading and procuring axes, the party again pro-



ceeded to the spot, where one bear was despatched by a cut on the head with an axe, and the other was killed in the cave. The dead hunter was buried on the spot; the other recovered, but his face was very much disfigured. The bears were all butchered, (*i. e.* cut up,) and the meat cured."

Passing over the Raccoons, Coatis, Badgers, Glutons, and Ratels, in which we gradually lose all likeness to the Bears, except in their plantigrade walk, we notice the

## II. DIGITIGRADA,\*

or those which walk on tiptoe. In looking at the hind leg of a dog, we are at first sight apt to suppose that the projecting joint which forms almost a right angle is the knee, though it is in fact bent the wrong way. It is no other than the heel of the foot, which is elevated at this distance from the ground, the whole tread being on the toes. With this peculiarity are associated a superior lightness of form and swiftness of motion, and more predaceous habits. The first family consisting of the Weasels, has been styled *vermiform*, on account of the slenderness, length, and flexibility of their bodies, allowing them to insinuate themselves into the smallest passages in pursuit of prey. Though mostly small, they are sanguinary and daring, often attacking animals much larger than themselves. They are arranged into four genera.

\* *Digitus*, a finger, and *gradior*, to step.



*Mustela,\* the Weasel.*

Under this genus are included the well-known Polecat, (*M. Putorius*,) the terror of the poultry-yard; the Ferret, (*M. Furo*,) noted for its white coat and pink eyes, and for its utility in hunting rabbits and rats; the Ermine, or Stoat, (*M. Erminea*,) whose winter fur is so highly valued; and the common Weasel, (*M. Vulgaris*,) the least and the prettiest of the whole. Besides these of our own country, there are several others distributed over Asia and Africa. They all prey indiscriminately on any animals they can master, from the field-mouse to the hare, often robbing the poultry-yard, and the game-preserve; and occasionally even entering the water in pursuit of fish. The brains of the victim are the favourite morsel, the extraction of which is the first and sometimes the only result of the slaughter. They are all marked by the diffusion of a rank disgusting odour, surpassed, however, by that of a genus which we shall presently notice.

The change of colour in the Stoat from deep red in the summer to its winter hue of pure white, is too remarkable a phenomenon to be passed over without mention. It is common to many animals, birds as well as quadrupeds, inhabiting the high northern latitudes, of which the Stoat is more particularly a resident. On the unbroken snows of Siberia it would, in its summer hue, be conspicuously visible; concealment is then one object gained by

\* Its Latin name.

its change. "But this," says Mr. Bell, and it is a beautiful proof of Providential care, "is not the most important advantage gained by the assumption of the white clothing in the winter season. It is too well known to require more than an allusion, that although the darker colours absorb heat to a greater degree than lighter ones, so that dark-coloured clothing is much warmer than light-coloured, when the wearer is exposed to the sun's rays; the radiation of heat is also much greater from dark than from light-coloured surfaces, and consequently the animal heat *from within* is more completely retained by a white than by a dark covering; the temperature therefore of an animal, having white fur, would continue more equable than that of one clothed in darker colours, although the latter would enjoy a greater degree of warmth whilst exposed to the sun's influence. Thus the mere presence of a degree of cold, sufficient to prove hurtful, if not fatal to the animal, is itself the immediate cause of such a change in its condition as shall at once negative its injurious influence."\*

*Martes,† the Marten.*

The Martens are closely allied to the Weasels, but having an additional false molar, and a tubercle on the inferior lacerator, they are rather less sanguinary. Distinguished in form by greater elegance of contour, large open ears, and a long bushy tail, they are marked also by habits more decidedly arboreal.

\* Brit. Quad. p. 154.

† Its Latin name.

Creeping from branch to branch, they silently and stealthily pursue small birds, squirrels, &c., though occasionally they descend to terrestrial game. They frequent the glooms of the dense forests, in which we find our own native species (*M. Foina*, and *M. Abietum*); several others are from North America, and Siberia produces the Sable, (*M. Zibellina*), so famous for its rich fur.

*Mephitis,\* the Skunk.*

The Skunks resemble the Polecats in the number and form of their teeth; but they also shew an affinity to the Badgers in the fore claws being formed for digging, in being half-plantigrade, and in the distribution of their colours, being black with more or fewer white stripes on the back. In a family notorious for a fetid odour, the Skunks stand pre-eminent; a North American species in particular, (*M. Americana*), exhales a feter, the most nauseous and overpowering that can be imagined.

*Lutra,† the Otter.*

This last genus of the Mustelidæ exhibits a beautiful specimen of the modification of organs to fit them for habits varying from those of the typical form. Destined to pursue and to feed on living fishes, it must be made an aquatic animal, and furnished with means of swift progression beneath the water. The body is long, but flattened; the legs are short, and capable of being turned outwards in

\* Lat. a stink.

† Its Latin name.

swimming; the feet are broad and webbed; the tail is flat and broad, forming a rudder; the outer fur hard, smooth, and shining; and the teeth, though like those of its family, are more powerful, and armed with sharp points to hold its slippery prey. Its success answers to its formation; it swims and dives with peculiar ease and swiftness, and captures its glittering booty with unerring skill. It always comes on land to eat it, holding it in its fore paws, and beginning at the head. We possess one native species, (*L. Vulgaris*,) if not more. Others are found in the rivers of North and South America, India, and South Africa, and one marine species in the North Pacific Ocean.

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The second family of the Digitigrade Carnivora comprises the Dogs, *Canidæ*. The number and form of their teeth indicate propensities somewhat less carnivorous than those of the Weasels, and with this their habits agree; still, however, the strength of their canines, and the form of their lacerators, shew a high degree of aptitude for subsisting on recent flesh. The peculiarity of their dentition consists in the presence of an additional tuberculous tooth in the upper jaw, and in the upper lacerator being furnished with a large heel. The length of their limbs gives them a superior swiftness, which is capable of being long sustained from their strength of muscle and sinew. The tongue is unfurnished with those prickly points which render this organ in the Cats so efficient in tearing flesh; the toes, five on the fore

feet, and four on the hind, are furnished with short, blunt claws, incapable of being sheathed, and of no use in seizing prey, or in climbing trees. They do not possess courage proportioned to their strength, and although the Dog may seem an exception to this assertion, his courage is exerted only when countenanced and supported by the presence of man, to whom, as it has been well observed, he looks as to a god.

*Canis,\* the Dog,*

forms the first genus of this family ; “ the friend and companion, while still the faithful, and humble, and laborious servant ” of man in all ages and countries. Endowed with almost a human intellect, great susceptibility of education, and strong memory, combined with strength of nerve, fleetness of limb, and power of patient endurance, he has devoted his faculties unreservedly to man, clinging to him amidst all his vicissitudes and reverses, in poverty and want, and disgrace, with a most affectionate faith, a perseverance of attachment that no circumstances can wear out or subdue. The original of the Dog, (*C. Familiaris*,) has hitherto baffled the researches of zoologists ; it seems pretty clear that no animal exists in an independent state, to which we may refer his parentage. If, indeed, the varying races into which the domesticated Dog is divided had one common stock, if they are all but varieties, and not species, it may not be extravagant to suppose him a primeval gift to man, by whose aid all other useful

\* Its Latin name.

racés might be captured and subdued. Several naturalists of high name, however, conceive him to be a domesticated Wolf, and support the opinion with strong arguments, founded on similarity of anatomical structure, the period of gestation, mental disposition, and on the tendency manifested by Dogs when allowed to become wild, to acquire the form of the Wolf.

In a work like the present we cannot dwell upon the endless varieties of the domestic Dog, nor pause to relate any of the numerous anecdotes of his sagacity or faithfulness which are so abundant, nor point out the gradations of his mental and bodily power, from the highly educated, and half-reasoning Shepherd's Dog, down to the stupid, helpless, and degenerate Pug.

The Wolf, (*C. Lupus*), in ferocity and sanguinary propensity for blood, approaches, if he does not equal, the Cats. Inhabiting the wilds and forests of Northern Europe, his prey often rendered scarce by the ravages of winter, he is driven from the mountains, reckless and furious with hunger, and, pouring down in packs upon the villages and hamlets, spares neither man nor beast. The ravages committed by them are beyond calculation. The official returns of farm stock killed by wolves, in a single province of Russia, (Livonia,) in one year, 1823, will give some idea of these depredations. Horses and foals 3084; horned cattle 2540; sheep and lambs 15,908; goats and kids 2728; swine 4502, besides smaller animals. Mr. Nilsson says, that the Wolf first tears

out the entrails of his victim, and then devours the heart, liver, lungs, &c. His bite is cruel and deadly, and so keen that he usually brings away with him the piece of flesh into which he has fastened his fangs. The strength of his neck and jaws is so great, that it is said he can carry a sheep in his mouth and run off with it. When not pressed with hunger, however, his courage is but small; he does not willingly encounter a man, and even a bell about the neck of a sheep will be sufficient to deter him from the assault.

Yet with all his ferocity, the Wolf is capable of as ardent and as enduring an affection as his more honoured relative the Dog. M. F. Cuvier narrates an instance, in which a Wolf, “brought up as a young dog, became familiar with every person whom he was in the habit of seeing, and in particular followed his master everywhere, evincing evident chagrin at his absence, obeying his voice, and shewing a degree of submission scarcely differing in any respect from that of the most thoroughly domesticated dog. His master, being obliged to be absent for a time, presented his pet to the *Ménagerie du Roi*, where the animal, confined in a den, continued disconsolate, and would scarcely take his food; at length, however, his health returned, he became attached to his keepers, and appeared to have forgotten all his former affection; when, after eighteen months, his master returned. At the first word he uttered, the Wolf, who had not perceived him amongst the crowd, recognised him, exhibited the



most lively joy, and being set at liberty, lavished on his old friend the most affectionate caresses, as the most attached dog would have done after an absence of a few days. A second separation was followed by similar demonstrations of sorrow, which, however, again yielded to time. Three years had passed, and the Wolf was living happily in company with a dog which had been placed with him, when his master again returned, and again the long-lost, but still remembered voice was instantly replied to by the most impatient cries, which were redoubled as soon as the poor fellow was at liberty; when rushing to his master, he threw his fore feet on his shoulders, licking his face with every mark of the most lively joy, and menacing the keepers, who offered to remove him, and towards whom, not a moment before, he had been shewing every mark of fondness. A third separation, however, seemed to be too much for this faithful animal's temper; he became gloomy, desponding, refused his food, and for a long time his life appeared in great danger. His health, however, returned; but he no longer suffered the caresses of any but his keepers, and towards strangers manifested the original savageness of his species."\* There is a Black Wolf, (*C. Lycaon*,) found in Europe, and another, (*C. Nubilus*,) in North America. There are also two or three other American Wolves.

We must mention also the Jackal, (*C. Aureus*,) a species less than the preceding, and evidently ap-

\* Mammifères.

JACKAL (*Canis Aureus*).

proaching the Foxes. It inhabits the whole of Africa and Southern Asia, and is probably the Fox of the sacred writings. They hunt in packs during the night, but being very cowardly often content themselves with carrion. In company with the Hyæna, it tenants the ruined palaces of Western Asia, whence its appalling shriek continually ascends as it prowls around the mouldering walls, realizing the fearful picture of desolation so vividly drawn by the pen of inspiration: "And Babylon, the glory of kingdoms, the beauty of the Chaldees' excellency, shall be as when God overthrew Sodom and Gomorrah. It shall never be inhabited, neither shall it be dwelt in from generation to generation; neither shall the

Arabian pitch tent there, neither shall the shepherds make their fold there. But wild beasts of the desert shall lie there; and their houses shall be full of doleful creatures; and owls shall dwell there, and satyrs shall dance there. And the wild beasts of the islands shall cry in their desolate houses, and dragons in their pleasant palaces.”\*

*Vulpes,† the Fox.*

The Foxes differ from the dogs by a longer and more bushy tail, by a more pointed muzzle, and by the pupil of the eye, which, in contracting under the stimulus of light, assumes a linear form, like that of the Cats, instead of a circular one, as in the Dogs. They burrow in the earth, prey only on the smaller animals, and diffuse a rank odour. The species are small, but rather numerous, scattered over the world with the exception of Australia. They are noted, even to a proverb, for sly circumspection, and insidious cunning; timid and cowardly, they never “do battle” except when driven to extremity. Still more nocturnal than the Wolf, they cannot bear the stimulus of broad daylight, “which soon becomes painful to their eyes, thus compelling them to close their pupils to such an extent as to render their vision very imperfect. Much of the cunning suspiciousness of manner for which the Fox is notorious is due to this very circumstance; his attitudes and motions necessarily partake of the uncertainty of his sight, and he appears to be most cunning when he

\* Isa. xiii. 19—22.

† Its Latin name.

is in reality most short-sighted. To shade himself as much as possible from the light, he hides himself in burrows during the day, and prowls abroad in full possession of his perceptive faculties under the influence of a clouded night." To the same cause may be attributed the crouching posture, trailing the belly nearly on the ground, in which they habitually move, so different from the bold and fearless march of the Dog.

The notoriety of our own species, the object of sporting ambition, (*Vulpes Vulgaris*,) renders any specific description superfluous; and most of the foreign species, the North American ones especially, (*V. Fulvus*, *V. Cinereo-argenteus*, *V. Decussatus*, and *V. Argentatus*,) are too much like our own, to need it. There are one or two in Africa, however, which are marked by the great developement of their ears, the smallness of their size, and the paleness of their colour.



*Viverra,\* the Civet.*

This genus includes several animals of small size, whose characters vary much among themselves. In general they approximate to the Cats, in their dentition, in a tongue bristled with points, and in claws more or less retractile. Most of them have, in the hinder part of their body, a peculiar pouch into which an unctuous, and in some species a fragrant substance oozes, formerly valued as a perfume. They inhabit Africa and the Indian Isles. Besides the common Civet, (*V. Civetta*,) we shall only notice the Paradoxure, (*V. Typus*,) which to the claws of the Cats, and the teeth of the true Civets, joins a nearly plantigrade walk, and a tail which it can twist spirally.

*Hyæna,† the Hyena.*

Possessing many characters in common with the Dogs on one hand, and the Cats on the other, the Hyenas form an intermediate link, sufficiently separate from either. Their alliance with the former is indicated by their short claws, which are not sheathed, by their form and general contour, and by their cowardliness during the day; while the tongue beset with strong horny *papillæ*, and the prevalence of transverse stripes or spots on their coats, shew their affinity with the latter. They differ from both, however, in having but four toes on the fore feet, as well as on the hind, in their dentition, and in a stiff

\* Its Latin name.

† Its Greek name, from *ὕς*, *hys*, a hog.

erectile mane on the neck and back. They are natives of Africa, but one species extends into the south of Asia. They possess prodigious strength in the muscles of the neck and jaws, so that it is almost impossible to wrest anything from their gripe. Deep and gloomy caverns, or the ruins of deserted towns, are their selected abodes, whence they issue by night to prowl around the villages for dead animals, or betake themselves to the tombs and graves to feast on the decomposed corpses of men. "In a field of battle in South Africa no one ever buries the dead; the birds and beasts of prey relieve the living of that trouble. Even the bones, except a few of the less manageable parts, find a sepulchre in the voracious maw of the Hyena."†

Asia and the north of Africa are allotted to the Striped Hyena, (*H. Vulgaris*,) while the Spotted, (*H. Crocuta*,) and the Long-haired, (*H. Villosa*,) inhabit the southern portion of the latter continent. The first named is the one of which so many ridiculous stories have been related, such as that of its untameable ferocity, propagated most industriously by ignorant showmen, while the poor animal habitually underwent the most tormenting treatment, in order to show the wondering public "how fierce and untameable he was!" This species is perhaps the Wolf of the scriptures. The Spotted Hyena is common at the Cape, where, under the name of the Tiger-wolf, it has been domesticated, and even trained to the chase; and found to possess the perseverance,

\* Pringle.



SPOTTED HYENA (*H. Crocuta*).

intelligence, and fidelity of the dog. In a state of captivity in our menageries, it has frequently manifested great warmth of attachment to its keepers, fully equal to that of the dog. But in its native condition it possesses the ravenous voracity of the genus, attacking cattle, and even entering the huts of the natives, when emboldened by the cover of night. It is probably this species, (*H. Crocuta*), to which Mr. Steedman alludes in his very interesting "Wanderings."

"Mr. Shepstone, in a letter from Mamboland, relates that the nightly attacks of wolves, as the Hyænas are generally called, have been so destructive amongst the children and youth, as to form quite an anomaly in the history of this animal; for



within a few months not fewer than forty instances came to his own knowledge, wherein that beast had made most dreadful havoc. ‘To show clearly,’ he says, ‘the preference of the wolf [Hyæna] for human flesh, it will be necessary to notice, that when the Mambookies build their houses, which are in form like bee-hives, and tolerably large, often eighteen or twenty feet in diameter, the floor is raised at the higher, or back part of the house, until within three or four feet of the front, where it suddenly terminates, leaving an area from thence to the wall, in which every night the calves are tied, to protect them from the storms, or from wild beasts. Now it would be natural to suppose, that should the wolf enter, he would seize the first object for his prey, especially as the natives always lie with the fire at their feet. But notwithstanding this, the constant practice of this animal has been in every instance to pass by the calves in the area, and even by the fire, and to take the children from under the mother’s kaross, and this in so gentle and cautious a manner, that the poor parent has been unconscious of her loss, until the cries of her little innocent have reached her from without, when a close prisoner in the jaws of the monster. To give all the instances I could adduce would tire your patience; I will therefore give only two, with which we have been more immediately concerned; and which, while they shew how much they want who want the gospel, will also shew that the tender mercies of the wicked are cruel.

“The first I shall mention is that of Dapa’s great

grandson, about ten years of age. The Wolf had previously seized a younger brother, and torn away a part of his face. Another night he came into the house and took a second, carrying him completely off, nothing more than a small fragment being found. On his third visit, he seized the lad first mentioned by the left shoulder. The little fellow awakened by this grasp, struck him with his hand; the Wolf let go his hold, and seizing him on the opposite side, broke his collar bone: the poor boy still fought with his left hand; and his antagonist letting go his hold a second time, grasped him by the fleshy part of the thigh, and ran off with his prey; nor was it until he had carried him a quarter of a mile, that he could be made to drop him; when, biting away the precious mouthful, he left the little sufferer with his thigh half severed, but fortunately the bone was not broken. In this state he was brought to us for help, and by daily attention he is perfectly restored.

“The second instance is of a little girl, about eight years of age, who was reclining on the ground in the cool of the day, when four of these monsters rushed upon the place. One of them seized the little creature by the head, a second by the shoulder, and the other two by the thighs. The people of the kraal flew to her help with all possible speed, and succeeded in releasing her, but apparently too late. They tried their medicines for a few days, but finding all hope fail, and as from the heat and flies she had now become loathsome, they gave her the choice either to be put to death by the youths of the place,

or go to the woods to die, or be farther devoured, as might happen! The little girl chose the woods, determining in this forlorn condition to cast herself on the mercy of this institution; and although she had never been at the station, she believed from what she had heard, that could she reach the place, she should receive the protection and help which he who claimed the endearing name of father, had longer refused to give, and which she had no right anywhere else to expect among her own nation. With this resolution she set out, and although she had to travel several miles through deep glens, succeeded in reaching the station, an awful picture of deformity and suffering, all but in a state of nudity, covered with large wounds to the number of fourteen, among the most ghastly of which was that of the head and face; the Wolf, having endeavoured to grasp the whole head, had torn the mouth open to the ear, and stripped the head of the upper part of its covering, making a terrible wound of eight inches. Through the mercy of God she is quite recovered, and scarcely at all deformed; but she refuses ever to return to those who forced her into the woods to die. I am happy to add, that, a few days since, as I was walking a little distance from the house, I heard some one in fervent prayer; and as I could discover the voice was that of a child, I made towards it, and found in a little secluded spot amongst the weeds my little patient, who was earnestly pouring out her soul to the God of all mercies, where she thought no eye saw, or ear heard her but His.'''\*

\* Wanderings in S. Africa, p. 198.

*Felis,\* the Cat.*

We have now arrived at that genus which is the type of the carnivorous order, in which the appetite for living flesh is found in the highest degree, accompanied by an organization adapted in every respect to the fulfilment of their instincts in the slaughter of other animals. They have but two false molars in each jaw, no tuberculous tooth below, and but a very small one above, but the lacerators terminate in pointed and trenchant lobes of great power, fitted for crushing large bones, while the canines are long, stout, and pointed, for tearing the large masses of quivering flesh which are swallowed without chewing. To second these powerful weapons, the jaws are short, while the mouth is wide; and moved by muscles of extraordinary size and strength, whose whole force is exerted in giving a vertical motion. The tongue answers an important purpose in feeding; being furnished, towards the base especially, with numerous prickly points directed backwards, which tear the flesh, open new channels for the blood, and enable the tongue, like a flexible file, to scrape every particle of flesh and ligament from those bones which resist the force of the teeth.

But their weapons of offence are not confined to the organs of the mouth; every one must have observed the use which the domestic Cat makes of her fore feet in the capture of prey and in defence, as well as the power, agility, and precision of their

\* Its Latin name.

motions. The larger species take their prey in the same manner, by rapid bounds. The flexibility of their spine accompanied by the power of their muscles enables them to throw themselves forward with prodigious violence upon their victim, and to inflict a sudden blow at the moment of descent, which in general either kills or disables it. The toes, which are numbered as in the Dogs, are furnished with large, sharp, curved claws, whose mechanism is singularly beautiful and instructive. To preserve the fore claws fit for use, it is necessary that the points should not come in contact with the ground; but if they pointed permanently upwards they would be useless. There is, therefore, a peculiar provision made, by which they are enclosed within sheaths formed by a fold of the skin at the tip of each toe, where they lie concealed in the hair, until a muscular action draws the base downwards, and the bristling talons stand out with their sharp points and cutting edges ready for action. The silent tread of the Cats is partly owing to this structure, and partly to the elastic pads of granular fat with which the balls of the toes are furnished, and which likewise serve to break the shocks, to which their violent leaps would otherwise expose them. The prostrate victim is usually torn by the united action of the teeth and the claws: pressing the animal to the ground with the feet, and pulling limb from limb by muscular force, the Cat swallows the flesh almost whole, occasionally licking the blood with the prickly tongue. The claws are sometimes used as prehensile organs;

the common Cat will frequently lay hold of a morsel with her claws, which she cannot otherwise reach, and convey it to her mouth. We have seen a Cat which, in the presence of the family, frequently performed a feat with these organs which would seem to require great strength, precision, and agility. In the boards of the kitchen floor was a round hole, about two inches in diameter; here the Cat would sit and watch the rats as they ran to and fro on the earth about six inches below the floor; at length she would dash down one paw, and seldom failed to bring up a rat through the hole with her talons.

The Cats are furnished on each side of the face with a series of long and stiff projecting bristles, (*vibrissæ*,) often absurdly called *smellers*, imbedded in a soft elastic pad. They appear to be organs of feeling, and to be endowed with great sensibility. Of the other senses, their sight is acute, especially during night, and their hearing still more developed, but they derive little aid from the organs of smell.

It has been wisely ordained, however, that with all these advantages of physical force, their intellectual powers are by no means commensurate. "Were it not for that degradation in their mental faculties, which renders them incapable of employing their physical powers in concert with each other, what ravages would they not be enabled to commit? What could resist their prodigious and destructive force, if that force were accompanied by the sagacity of the Dog, or even of the Wolf? But it has been wisely provided that in the same proportion as these



beasts advance in the accumulation of corporeal means of destruction, they should recede in those intellectual qualifications which might otherwise be made the means of devastating the creation, while they are the less necessary for their individual preservation.”\* The season of activity allotted to carnivorous animals, is no less an instance of beneficent providence. Were their ravages committed during the day, how much greater would be the destruction of human life ! But in the present constitution, the one sleeping while the other wakes, the sacrifice of man to the carnivorous brutes becomes an event of comparatively infrequent occurrence.

It has been demanded, Why were animals so rapacious and destructive, created ? and the answer has been somewhat complacently given, To keep down the vast herds of ruminating animals, which otherwise would destroy “every green herb.” To the question, Why are the herbivorous animals endowed with powers of increase so far exceeding the wants of man ? the answer is equally ready ; To supply food for the carnivorous races. In other words the antelope is useful to feed the lion ; and the lion is no less useful to eat up the antelope. This reasoning is somewhat childish. The very question appears to originate in false principles. We are so apt to take for granted that God had in view man’s convenience and welfare *alone* in forming this world, that when we meet with any laws which appear independent of, or even opposed to, his interest, we

\* E. T. Bennett.



feel dissatisfied and puzzled, as if it were incumbent on a Christian philosopher to “justify the ways of God,” on this single assumed principle. What was the *ultimate object* of Infinite Love and Wisdom in the creation of the inferior animals, our utter ignorance of their destiny prevents us from discerning ; but it appears no less consistent with philosophy than with religion, to believe that at least one object was, the diffusion of enjoyment and consequent happiness, on as large a scale as possible. And this design we may be sure is fulfilled.

The geographical distribution of the Cats is very extensive, as they are spread over most parts of the world, except Australasia. They, however, most abound in the teeming forests of tropical America, and the hot jungles of insular and continental India. The Lion, (*F. Leo*,) is placed, not without reason, at the head of the typical genus of the Carnivora. In size, power, boldness, and capacity of destruction, he is unrivalled, while he is equally distinguished by his noble front, and by his majestic port and bearing. The high eulogiums often passed upon his forbearance and generosity, have little foundation in fact. It is true that his appetite appears somewhat less sanguinary than that of some other of the Cats ; that he delights more in the flesh than in the blood of his prey, and therefore is satisfied with less of slaughter ; but the instances occasionally recorded of his refraining from attacking man, have been probably owing to sated appetite ; the forbearance, not of clemency, but of indifference and sloth.

The Lion is found throughout the whole of Africa, and the southwest of Asia; he formerly infested even the southeast of Europe, but thence he has long disappeared. There is, however, some reason for believing that the African and Asiatic Lions are two species, of which the latter is rare, except in the eastern regions of Persia. It is in Africa that he reigns in his majesty, where, especially in the south, he stalks over the vast plains, complete lord of the ascendant, and finds abundance of prey in the countless herds of antelopes and quaggas that graze on the parched herbage.

The broad front of the Lion, adorned with a long and shaggy mane, which is erected when he is angry, his muscular limbs, and his tufted tail, give him an appearance differing from that of his congeners. Still, however, in structure and habits he is a genuine Cat. The colour is a dusky yellow, more inclining to brown in the African variety, in which the mane is also darker and much larger. When young, the body is marked with several distinct, though faint, stripes and spots; a remarkable circumstance, as indicating a tendency to that spotted hue so characteristic of the genus. The Puma whose coat in adult age is of an uniform hue, is in youth similarly varied.

The voice of the Lion, his well known roar, has obtained deserved celebrity; it is stated to be peculiarly grand and terrific, even resembling the noise of an earthquake. He prowls by night, rarely preying while the sun is up; and is said to be particu-

larly active amidst the lightning and rain of the terrific thunder-storms which so often occur by night in South Africa. Mr. Burchell says, "Such nights I already knew by dear-bought experience, favour the prowling Lion, and seem to give him a spirit of daringness which he seldom evinces at other times. Taking advantage of the disorder and confusion into which the other animals are thrown by the conflicting elements, which make no impression on him, he appears to advance upon them with less caution than usual." The amazing strength of the muscles of his great head and neck is shewn in his ability to carry, even for miles, such animals as a horse, a heifer, or a buffalo. "His mode of attack is generally from ambush, approaching slowly and silently till within a leap of his destined prey, on which he then springs, or throws himself with a force, which is thought, in general, to deprive the victim of life before the teeth are employed. It is said that this blow will divide the spine of a horse, and that the power of his teeth and jaws will break the largest bones. His mode of attacking the buffalo is by springing on him, and fixing his fangs in the throat; then sticking his paw into the animal's face, he twists round the head, and pins him to the ground by the horns, holding him in that situation till he expires."

In the wild glens and bushy plains of the Cape Colony, the Lion is still abundant, and many spirit-rousing adventures, many bold assaults, and many hair-breadth escapes are upon record. Mr. Steed-

man mentions the following: “The father of the young man who accompanied me, was celebrated in this part of the country for his exploits in Lion hunting. On one occasion, while shooting with his son, the latter came unexpectedly upon a Lion, and fired, but missed his aim, when the animal rushed fiercely upon him. The father, who witnessed from a distance what had occurred, with all that coolness and confidence which those only who are accustomed to such encounters can command, came to his son’s assistance; and approaching within a few yards of the spot where the Lion lay with closed eyes, growling over its victim, whom it seemed to press closer to the earth, as if fearful of losing its prey, he levelled his piece and fired; the ball passed through the animal’s head, when it rolled over, and after a few struggles expired, near the body of the young man, who, to the inexpressible joy of his parent, had sustained no serious injury, although it was some time before he recovered from the terror into which he had been thrown. On my remarking that it was a surprising deliverance, ‘Yes!’ he exclaimed emphatically, ‘God was there!’”\*

Hunting parties are frequently formed for the express purpose of seeking in his lordly haunts, and openly attacking, this formidable savage, and many of the Dutch boors are famed for their skill and daring. Mr. Steedman mentions a young man who had shot upwards of fifty Lions, since the farm on which he resided had been in his father’s possession.†

\* Wanderings in S. Africa, vol. i. p. 178.

† Ibid. p. 120.

The following interesting narrative will give an idea of this noble but hazardous sport: "We resolved to descend to the valley, where there was a large pool of water, and unsaddle our horses for half an hour. As we moved on for this purpose, I observed two of the Hottentots riding in the rear alongside of each other, conversing in a whisper, and with their eyes steadily fixed on some distant point in the hollow below. After a long, silent, and intent gaze, their eyes met, as they simultaneously looked up as if to read each other's thoughts, and one said in a low, cautious tone in Dutch, 'They are lions.'

"The intelligence caused an instant halt; and after a hasty exhortation to keep together, we grasped our double barrels, and gave the spur to our steeds to overtake the chase, who were soon out of the long slope, and going off to the opposite slope. Captain A.'s clear 'tally-ho' was chorussed loudly as we galloped down the brae, cheering to bring them to; when from the same rushy bottom emerged two others, going off to the right, and for them we immediately rode, and quickly swept through the firm, though rank, grassy hollow. As we were fast gaining on them up the rise, they suddenly swung round in succession, like two cutters, suddenly letting go anchor while carrying a press of canvass off the wind; and there they lay couched, two Lionesses seemingly, with heads erect, and glaring eyes, jaws half opened and swinging tails."

Having dismounted to attack the nearer of the two,—

“The scene was now magnificently grand and exciting. Broad sheets of lightning flashed from every part of the heavens ; heavy drops were falling, and a general gloomy mist half veiled the hills, but unheeded, for every eye was fixed on one spot, where the noble savage lay facing us with a stern countenance ; her wide, round, yellow eyes, with small jet black pupils glaring fiercely, and her massy forepaws half raising from the turf her milk-white chest and throat. She lashed the ground on either side alternately with her tail, which swung over her back in regular pendulum-like vibrations, and her formidable jaws opening with a grim yawn, seemed to emit from time to time hollow half suppressed roars, which, however, were inaudible from the now uninterrupted rattle of the thunder. Her companion lay about twenty paces behind her. Major C. begged us to let him have a first shot at her, to try a new rifle he had brought as his second gun, and we halted while he fired at about thirty-five paces ; but his ball fell three yards short, and, to our surprise, was quite unnoticed by the Lioness, who still lay as we again advanced. Suddenly the two dogs made a violent rush forward, and Captain A., alarmed for his favourite, exclaimed, ‘Let us fire now.’

“He and Mr. B. fired and wounded her ; instantaneously bounding on her feet, she was coming in with a heavy lumbering gallop, when a volley of four shots sent her rolling over head foremost ; and the dogs running in began to lay hold and bite



at her hind legs, instinctively keeping at a respectful distance from her head ; but she was quite dead.

“ We reloaded to prepare for the other ; but she, or he, (for we had afterwards reason to believe it was a young male) had risen on the first rush of the dogs, and turning about a hundred yards off, one of the shooters had seen him couch again. However he was nowhere to be seen, having probably stolen off during the smoke of our shots ; and we ran up to where the first lay, and stood gazing in admiration of our prize. She was a very handsome, full-grown Lioness, measuring nine feet from nose to tail ; her skin beautifully sleek, and the upper part of a rich tawny, darker down the spine, while the jaws, throat, belly, and inside of the legs, were of a pure milky-white. Her bright yellow eyes were wide open and life-like, while five bullet holes in her chest and shoulders, out of the six shots, reflected no disgrace on our shooting.

“ We called up the servants with our horses, and remounting, rode briskly under the heavy rain, with our guns pointed downwards, for fear of accident from the lightning, in the direction we supposed the other to have taken ; but, after a short unsuccessful search, it was determined, as the shower was nearly over, and the thunder rolling away in the distance, to off saddle and turn our horses loose to graze and roll, previously to commencing a pursuit of the first two Lions.

“ While sitting in debate after dinner on the disappointment of all our fair hopes, and the mort-



fication of returning to the post with but one skin, to-morrow being the last day we could remain on the ground, it struck us to try, as a last expedient, sending out three of the mounted Hottentots before dawn, for the chance of seeing Lions, if there were any in the country; and if they did, to follow them to their lair, and, while two remained in observation, to despatch the third with the news to us; and a subscription was forthwith entered into, to reward them if successful. Schumacker, a dark-visaged Bastaard, of well-known nerve, and eagle-eye, was called into council; and after a little hesitation at first, agreed to go, and we told him to choose his companions: he pitched on two, both equally well acquainted with the country, and some hours after, they departed before day-light.

“In the morning, after we had bathed and breakfasted, we shot at empty bottles, and the bright sunny day wore on; the guns were duly cleaned and laid by loaded, and we looked at our watches and began to despair, when, about twelve o’clock, a Hottentot was seen slowly approaching on a tired horse. Captain A. ran down to meet him, and we saw him hold a brief and earnest converse, and then hold up both hands as a signal. It was quite enough; servants were loudly summoned, horses saddled, and guns brought forth; and then the guide, having got a fresh horse, we started in high glee; the man informing us, as we went along, how they had descried a *leuwe* and *weife* in the morning; how they had approached and followed them as they

slowly moved away, frequently turning round and growling at them, and how at last they entered and lay in a rushy hollow. An hour's ride brought us to the spot, very near the scene of the first day's find; and as we approached we saw the two Hottentots dismounted, and waiting us on the opposite slope above the hollow, in which they made signals that the Lions lay concealed by long green sedges and reeds. We circled round to them, and ascertained that they had not seen the animals for the last two hours and more, but they pointed out the spot where they couched, and were certain of their not having moved; so we descended on foot in a concave line to the edge of the long rank grass and sedges, and shouted to try and rouse them, Schumacker's bold companion advancing to the front, and assailing the female with various opprobrious epithets to make her come out, while the Hottentot servants, one and all, hung back in a remarkable way, not liking an approach to an unseen enemy. Indeed, we had great difficulty to prevent them making shields of us, and in getting them not to stand behind, but in the intervals; as we thought ourselves in more danger of getting shot by them in their trepidation, than of missing the Lions if they would come out. Out, however, they would not come; and we slowly beat down the edge of the hollow, trying to get the old hound to range it; but after a single scamper through the high grass, he kept on the other side, not seeming to like it. Some of us, impatient of the delay, wanted to enter

the cover, but this was loudly remonstrated against by the Hottentots, and overruled by our experienced companions, who knew the danger of one of the party being upset by a sudden spring of the animals, before the others could get a shot. At last the Lion suddenly sprang up, and with a short roar, or snort, and an impatient toss of his head and mane, bounded away down the little valley, one of the Hottentots immediately mounting and pursuing him with loud cries, and at last firing a shot, when he couched in a thick patch of reeds, the man remaining like a sentry on the declivity to watch him. The impatience of one or two now overcame all caution; and we advanced in a line in the high sedges, when the female suddenly went off with a smiliar leap and grunt, but in another direction, a shot fired by me to bring her to, having no effect. She lay again in a thick patch, about three hundred yards off, and we were now sure of her. We immediately followed, and lining the the nearest edge of the cover, here about seventy yards across, with some coaxing got the dog to enter. After beating a little, he was crossing towards us, when, all at once, as if fascinated, he stopped short, with his head on one side, and his nose pointing to a spot not three yards from him, and with a look of most ludicrous amazement, in fact, struck all of a heap, as they say; but quickly slinking off, he backed out of the scrape. On a shot being fired at the spot, up she bounded with a sharp angry roar, and at first came towards us,

bounding through the high grass with a few short hollow grunts; as if quailing at our formidable numbers, was wheeling to our right, when a volley laid her low; and after she fell, some shameful dropping shots from the armed servants tore the grass about her, and cut the skin off her back.

“Those who had fired reloaded, and we hastily mounted to push on for her mate. We had the advantage of the height, about five and twenty paces above the clump of reeds, when he started up, and wheeled away across us with the same appearance of adopting second thoughts; three or four shots were fired, and he fell head over heels into a sunken pool of water, heavily struck in the body. He swam across to the side next us; and, as we descended, we saw his head and bristling mane, and glaring eyes, protruding through the screen of reeds, as the wounded but undaunted creature clung to the bank, struggling to drag himself up and charge. A few shots in the head put him out of pain, and he fell back. When we looked over the edge, he lay quite dead, and almost under water; so having found a place where the bank shelved to the bottom, two of the party stripped and plunged in; and one taking him by the head, the other by the tail, they swam across to the creek. The scene was highly amusing and novel; the sun shining brightly on the animated party above, and on the oily brown skins of the naked Hottentots standing in the water, and the white gleaming shoulders and arms of the swimmers, as they impelled the half-seen corpse

through the deep blue mirror of the reed-fringed pool. When brought to land, he was flayed and decapitated for his skull. He was a young male, scarcely so large as a lioness, and his imperfect, short tawny mane, showed him to be not nearly full grown, which accounted for the most unusual circumstance of his declining fight, instead of coming in at once. The female, to which we returned, was of tolerable size, though not so large nor handsome as the first killed, though she had four unborn whelps, with downy skins, striped like the tiger. Our horses did not exhibit the least appearance of alarm or dislike to approach her close; but it is well known that they become paralyzed with terror, at the rush of a living Lion.”\*

Mr. Burchell has recorded an encounter, in which the Lion displayed much more of his characteristic dignity and fearlessness. Having roused from some rushes a large Lion and Lioness, the latter escaped, “but the Lion came steadily forward, and stood still to look at us. At this moment we felt our situation not free from danger, as the animal seemed preparing to spring upon us, and we were standing on the bank, at the distance of only a few yards from him, most of us being on foot, unarmed, without any visible possibility of escaping. I was on foot myself, and it was useless to attempt avoiding him. I stood well upon my guard, holding my pistols in my hand with my finger upon the trigger; and those who had muskets kept themselves similarly prepared. But,

\* United Serv. Jour. Aug. 1834.

at this instant, the dogs flew boldly in between us and the Lion, and surrounding him, kept him at bay by their violent and resolute barking. The Lion, conscious of his strength, remained unmoved at their noisy attempts, and kept his head turned towards us. At one moment, the dogs perceiving his eye thus engaged, had advanced close to his feet, and seemed as if they would actually seize hold of him ; but they paid dearly for their imprudence ; for without discomposing the majestic and steady attitude in which he stood fixed, he merely moved his paw, and at the next instant I beheld two dogs lying dead. In doing this he made so little exertion, that it was scarcely perceptible by what means they had been killed. Of the time which we had gained, by the interference of the dogs, not a moment was lost ; we fired upon him ; one of the balls went through his side, just below the short ribs, and the blood immediately began to flow ; but the animal still remained standing in the same position. We had no doubt that he would spring upon us ; every gun was instantly reloaded ; but he moved quietly away, though I had hoped in a few minutes to have been able to take hold of his paw without danger. This was considered by our party to be a Lion of the largest size, and seemed, as I measured him by comparison with the dogs, to be, though less bulky, as large as an ox. He was certainly as long in body, though lower in stature ; and his copious mane gave him a truly formidable appearance. He was of that variety



which the Hottentots and boors distinguish as the *Black Lion*, on account of the blacker colour of the mane, and which is said to be always larger and more dangerous than the other, which they call the *Pale Lion*. Of the courage of a Lion, I have no very high opinion ; but of his majestic air and movement, as exhibited by this animal, while at liberty in his native plains, I can bear testimony. Notwithstanding the pain of a wound of which he soon afterwards must have died, he moved slowly away with a stately and measured step.”\*

The Lion appears to be represented on the American continent by an animal somewhat like it in colour, but much inferior in size, and destitute of a mane. It is, however, a large Cat, being between four and five feet in length, exclusive of the tail. We refer to the Puma, or Cougar, (*F. Concolor*,) which in books of travels is often called the Lion, as the Jaguar is called the Tiger. The Puma has an extensive geographical range, having been found from Patagonia to Canada ; but in the northern division of the continent it is now nearly extirpated from the vicinity of the Atlantic border. It is active, and arboreal in its habits, preying on sheep, deer, &c., but will sometimes attack man with fatal results. Audubon gives an interesting narrative of a Cougar chase, to which we can only refer.†

But the finest and most interesting species of the genus, perhaps, with the exception of the Lion, is

\* Travels in Africa, vol. ii. p. 191.

† Orn. Biog. p. 198.



the Tiger (*F. Tigris*). Equalling that lordly animal



THE TIGER, (*Felis Tigris*,)

in size, superior in activity, and but little inferior in strength, its exceeding beauty, no less than its sanguinary ferocity, has made it celebrated in all ages; though it does not appear to have been so familiarly known to the ancients as the African Cats. The species is peculiar to Asia, inhabiting the whole southern portion of that continent, but extending as far north as Siberia, and found also in the great islands of the Archipelago. In the hot and teeming atmosphere of those dense jungles, which border the great Indian rivers, the Tiger is abundant, sleeping in the thick shades during the day, but creeping to

the forest edges, or to the springs and drinking-places of the rivers, at night fall, where he watches for the feebler animals that throng thither, and selects his fated victim. Not fearing man, he has been a formidable scourge in many parts of the East; and though in the war which has been unceasingly waged against him, reason has given to man the predominance of victory, it has not been obtained without a fearful sacrifice of life; and still a terrible revenge is often taken. Narratives of the boldness, ferocity, and success of his attacks on man, are familiar to every one. It crouches for its prey and seizes it by a sudden bound, as the other *Felidæ* do; but the particular manner in which it slaughters the victim is so curious, that we shall quote from Griffith's Cuvier an account of one which was exhibited by some Hindoos at Madras, to shew its manœuvring in obtaining prey. "For the purpose of this exhibition a sheep was fastened by a cord to a stake, and the Tiger being brought in sight of it, immediately crouched, and moving almost on its belly, but slowly and cautiously, till within the distance of a spring from the animal, leaped upon and struck it down almost instantly dead, seizing it at the same moment by the throat with its teeth. The Tiger would then *roll round on its back*, holding the sheep on its breast, and fixing the hind claws near the throat of the animal, would *kick, or push them suddenly backwards*, and tear it open in an instant." The common Cat when tickled, and biting half in play, half in earnest, will often suddenly practise

this last manœuvre, which is no doubt an instinctive action when highly excited.

Since the introduction of fire-arms into India, the hunting of the Tiger has become the most noble and most exciting of field-sports, and is pursued with great avidity by the British inhabitants. Mounted on well-trained elephants, which seem to enter with keenness into the spirit of their riders, the wealthy residents, both native and European, assemble with "pomp and circumstance" peculiarly eastern. The details of these dangerous sports are not a little interesting to us, whose notions of hunting rise no higher than running down a timid hare, or outwitting a paltry fox; but they are so numerous that it is extremely difficult to make a selection. We have chosen the following, however, because it is a fair specimen of all, interesting in its facts, graphically told, and above all, because it is given by a lady, one of the chief actors in the scene.

"We had elephants, guns, balls, and all other necessities prepared, and about seven in the morning we set off. The jungle was generally composed of corinda-bushes, which were stunted and thin, and looked like ragged thorn-bushes; nothing could be more desolate in appearance; it seemed as if we had got to the farthest limits of cultivation or the haunts of men. At times the greener bunches of jungle, the usual abodes of the beasts of prey during the daytime, and the few huts scattered here and there, which could hardly be called villages, seemed like islands in the desert waste around us. We stopped

near two or three of these green tufts, which generally surrounded a lodgment of water, or little pond, in the midst of the sand.

“ The way in which these ferocious animals are traced out is very curious, and if related in England, would scarcely be credited. A number of unarmed, half-naked villagers, go prying from side to side of the bush, just as a boy in England would look after a stray sheep, or peep after a bird’s nest. Where the jungle was too thick for them to see through, the elephants putting their trunks down into the bush, forced their way through, tearing up everything by the roots before them. About four miles from our tents we were all surrounding a bush, which might be some fifty yards in circumference (*all* includes William Fraser, alone upon his great elephant, Mr. Barton and myself, upon another equally large, Mr. Wilder upon another, and eight other elephants; horsemen at a distance, and footmen peeping into the bushes). Our different elephants were each endeavouring to force his way through, when a great elephant without a *howdah* on his back, called ‘Muckna,’ a fine and much esteemed kind of elephant, (a male without large teeth) put up, from near the centre of the bush, a royal Tiger. In an instant Fraser called out, ‘Now, Lady H. be calm, be steady, and take a good aim; here he is!’ I confess, at the moment of thus suddenly coming upon our ferocious victim, my heart beat very high, and for a second I wished myself far enough off; but curiosity, and the eagerness of

the chase, put fear out of my head in a minute; the Tiger made a charge at the Muckna, and then ran back into the jungle. Mr. Wilder then put his elephant in, and drove him out at the opposite side. He charged over the plain away from us, and Wilder fired two balls at him, but knew not whether they took effect. The bush in which he was found was one on the west bank of one of those little half dry ponds of which I have spoken. Mr. Barton and I conjecturing that, as there was no other thick cover near, he would probably soon return, took our stand in the centre of the open space; in a minute the Tiger ran into the bushes on the east side; I saw him quite plain; we immediately put our elephant into the bushes, and poked about till the horsemen, who were reconnoitring round the outside of the whole jungle, saw him slink under the bushes to the north side; hither we followed him, and from thence traced him by his growling, back to the outer part of the eastern bushes. Here he started out just before the trunk of our elephant, with a tremendous growl or grunt, and made a charge at another elephant farther out on the plain, retreating again immediately under cover. Fraser fired at him, but we suppose without effect; and he called to us for our elephant to pursue him into his cover.

“With some difficulty we made our way to the inside of the southern bushes; and as we were looking through the thicket, we perceived beau Tiger slink away under them. Mr. Barton fired, and hit him a mortal blow about the shoulder or back, for

he instantly was checked, and my ball, which followed the same instant, threw him down. We two then discharged our whole artillery, which originally consisted of two double barrellled guns, loaded with slugs, and a pair of pistols. Most of them took effect, as we could discover by his wincing, for he was not above ten yards from us at any time, and at one moment, when the elephant chose to take fright and turn his head round away from the beast, running his haunches almost into the bush, not *five*. By this time William Fraser had come round, and discharged a few balls at the Tiger, which lay looking at us, grinning and growling, his ears thrown back, but unable to stir. A pistol fired by me, shattered his lower jaw-bone; and immediately, as danger of approaching him was now over, one of the villagers with a matchlock went close to him, and applying the muzzle of his piece to the nape of his neck, shot him dead, and put him out of his pain. The people then dragged him out, and we dismounted to look at him, pierced through and through; yet one could not contemplate him without satisfaction, as we were told that he had long infested the high road, and carried off many passengers. One hears of the *roar* of a Tiger, and fancies it like that of a bull, but in fact it is more like the grunt of a hog, though twenty times louder, and certainly one of the most tremendous animal noises one can imagine.”\*

But many other means are resorted to for the destruction of this formidable animal, chiefly by the

\* Quoted in Nat. Lib. iv. p. 149.



natives, one of which is unique and amusing. “The track of a Tiger being ascertained, the peasants collect a quantity of the leaves of the *prou*s, which are like those of the sycamore, and are common in most underwoods. These leaves are smeared with a species of bird-lime, and are then strewed with the gluten uppermost, near to that opaque spot to which it is understood the Tiger usually resorts during the noontide heat. If, by chance, the animal should tread on one of the smeared leaves, his fate may be considered as decided. He commences by shaking his paw, with the view to remove the adhesive incumbrance, but finding no relief from that expedient he rubs the nuisance against his jaw, with the same intention, by which means his eyes, ears, &c., become agglutinated, and occasion such uneasiness as causes him to roll, perhaps among many more of the smeared leaves, till at length he becomes completely enveloped, and is deprived of sight; in which situation he may be compared to a man who has been tarred and feathered. The anxiety produced by this strange and novel predicament, soon discovers itself in dreadful howlings, which serve to call the watchful peasants, who in this state find no difficulty in shooting the object of their detestation.”\*

Perhaps the largest and most powerful of all the Cats, after the Tiger, (at least, of those distinctly known,) is the Jaguar, (*F. Onca*) of South America. It much resembles the Leopard in its markings, being studded with roses of black spots, upon a yellowish

\* Oriental Field Sports.



fawn ground, but differs in the details of the spots, in its more robust form, and in its superior size, being sometimes found five feet in length, without including that of the tail. He is spread over the greater part of the southern continent, and is said to be occasionally found in Mexico in the northern. He is a fierce and formidable animal, having great strength. He attacks the wild horses and oxen of the savannahs, in the mode already described as practised by the Lion. D'Azara relates that a Jaguar, having thus killed a horse, carried the carcass about sixty paces to the bank of a broad river, swam across with it, and then dragged it into a neighbouring wood in the sight of a person set to watch his motions. Like most of the Cats, except the Lion and Tiger, the Jaguar is an expert climber: Humboldt speaks of "his cry coming from the tops of the trees, followed by the long sharp whistle of the monkeys, which seemed to flee from the danger;" and Sonnini has seen the marks of his claws on the smooth and branchless trunk of a tree forty feet high, of which, though some slips were visible, he had succeeded in reaching the top.

The Leopard (*F. Leopardus*), and the Panther (*F. Pardus*), seem to be two distinct species, the former spread through Africa and South Asia, while the latter inhabits Africa alone; though naturalists have great difficulty in defining their characters. The Panther, however, is of larger size, and deeper colour; both, as has been observed, resemble in appearance the Jaguar. Accustomed to climb trees

with extreme agility, they pursue monkeys and the smaller animals among the branches, or spring upon the deer and antelopes on the ground beneath. Instances are on record of their natural ferocity having entirely yielded to kind treatment, being replaced by great docility and affection. The following account by Mrs. Bowdich, of a Panther in her possession, exhibits the animal in a very amiable view.

“ I am induced to send you some account of a Panther which was in my possession for several months. He and another were found, when very young, in the forest, apparently deserted by their mother. They were taken to the King of Ashantee, in whose palace they lived several weeks; when my hero being much larger than his companion, suffocated him in a fit of romping, and was then sent to Mr. Hutchison. This gentleman, observing that the animal was very docile, took pains to tame him, and in a great measure succeeded. When he was about a year old, Mr. Hutchison returned to Cape Coast, and had him led through the country by a chain, occasionally letting him loose when eating was going forward, when he would sit by his master's side, and receive his share with comparative gentleness. On the day of his arrival he was placed in a small court, leading to the private rooms of the governor, and after dinner was led by a thin cord into the room, when he received our salutations with some degree of roughness, but with perfect good-humour. On the least encouragement, he laid his paws upon our shoulders, rubbed his head upon us,

and his teeth and claws having been filed, there was no danger of tearing our clothes. He was kept in the above court for a week or two, and evinced no ferocity, except when one of the servants tried to pull his food from him; he then caught the offender by the leg, and tore out a small piece of flesh, but he never seemed to owe him any ill-will afterwards. He one morning broke his cord, and the cry being given, the castle gates were shut, and a chase commenced. After leading his pursuers two or three times round the ramparts, and knocking over a few children by bouncing against them, he suffered himself to be caught, and led quietly back to his quarters, under one of the guns of the fortress.

“ By degrees the fear of him subsided; and orders having been given to the sentinels to prevent his escape through the gates, he was left at liberty to go where he pleased, and a boy was appointed to prevent him from intruding into the apartments of the officers. His keeper, however, generally passed his watch in sleeping; and Sai, as the panther was called after the royal giver, roamed at large. On one occasion, he found his servant sitting on the step of the door, upright, but fast asleep; when he lifted his paw, gave him a blow on the side of his head, which laid him flat, and then stood wagging his tail, as if enjoying the mischief he had committed. He became exceedingly attached to the governor, and followed him everywhere like a dog. His favourite station was at the window of the sit-

ting-room, which overlooked the whole town; there, standing on his hind legs, his fore paws resting on the ledge of the window, and his chin laid between them, he appeared to amuse himself with what was passing beneath. The children also stood with him at the window; and one day, finding his presence an incumbrance, and that they could not get their chairs close, they used their united efforts to pull him down by the tail. He one morning missed the governor, who was settling a dispute in the hall, and who, being surrounded by black people, was hidden from the view of his favourite. Sai wandered with a dejected look to various parts of the fortress in search of him; and while absent on this errand the audience ceased, the governor returned to his private rooms, and seated himself at a table to write. Presently he heard a heavy step coming up the stairs, and raising his eyes to the open door, he beheld Sai. At that moment he gave himself up for lost; for Sai immediately sprang from the door on his neck. Instead of devouring him, however, he laid his head close to the governor's, rubbed his cheek upon his shoulder, wagged his tail, and tried to evince his happiness. Occasionally, however, the Panther caused a little alarm to the other inmates of the castle; and the poor woman who swept the floors, or, to speak technically, the *pra-pra woman*, was made ill by her fright. She was one day sweeping the boards of the great hall with a short broom, and in an attitude nearly approaching to all fours, and Sai, who was hidden under one of the sofas,

suddenly leaped upon her back, where he stood in triumph. She screamed so violently as to summon the other servants, but they, seeing the Panther, as they thought, in the act of swallowing her, one and all scampered off as quickly as possible; nor was she released till the governor, who heard the noise, came to her assistance. Strangers were, naturally, uncomfortable, when they saw so powerful a beast at perfect liberty, and many were the ridiculous scenes which took place; they not liking to own their alarm, yet perfectly unable to retain their composure in his presence.

“ This interesting animal was fed twice every day, but never given anything with life in it. He stood about two feet high, and was of a dark-yellow colour, thickly spotted with black rosettes; and from the good feeding, and the care taken to clean him, his skin shone like silk. The expression of his countenance was very animated and good-tempered, and he was particularly gentle to children. He would lie down on the mats by their side when they slept, and even the infant shared his caresses, and remained unhurt. During the period of his residence at Cape Coast, I was much occupied by making arrangements for my departure from Africa; but generally visited my future companion every day, and we in consequence became great friends before we sailed. He was conveyed on board the vessel in a large wooden cage, thickly barred in the front with iron. Even this confinement was not deemed a sufficient protection by the canoe-men, who were so alarmed

at taking him from the shore to the vessel, that, in their confusion, they dropped cage and all into the sea. For a few minutes I gave up my poor Panther as lost; but some sailors jumped into a boat belonging to the vessel, and dragged him out in safety. The beast himself seemed completely subdued by his ducking; and as no one dared to open his cage to dry it, he rolled himself up in one corner, nor roused himself till after an interval of some days, when he recognized my voice. When I first spoke he raised his head, held it on one side, then on the other, to listen; and when I came fully into his view, he jumped on his legs, and appeared frantic; he rolled himself over and over, he howled, he opened his enormous jaws, and cried, and seemed as if he would have torn his cage to pieces. However, as his violence subsided, he contented himself with thrusting his paws and nose through the bars of the cage to receive my caresses.

“The greatest treat I could bestow upon my favourite was lavender-water. Mr. Hutchison had told me, that on the way from Ashantee he drew a scented handkerchief from his pocket, which was immediately seized on by the Panther, who reduced it to atoms; nor could he venture to open a bottle of perfume when the animal was near, he was so eager to enjoy it. I indulged him twice a week by making a cup of stiff paper, pouring a little lavender-water into it, and giving it to him through the bars of his cage; he would drag it to him with great eagerness, roll himself over it, nor rest till



the smell had evaporated. By this I taught him to put out his paws, without shewing his nails, always refusing the lavender-water till he had drawn them back again; and in a short time he never, on any occasion, protruded his claws when offering me his paw. We lay eight weeks in the River Gaboon, where he had plenty of excellent food, but was never suffered to leave his cage, on account of the deck being always filled with black strangers, to whom he had a very decided aversion, although he was perfectly reconciled to white people. His indignation, however, was constantly excited by the pigs, when they were suffered to run past his cage; and the sight of one of the monkeys put him in a complete fury. While at anchor in the before-mentioned river, an Orang-utan was brought for sale, and lived three days on board; and I shall never forget the uncontrollable rage of the one, or the agony of the other, at this meeting. The Orang was about three feet high, and very powerful in proportion to his size; so that when he fled with extraordinary rapidity from the Panther to the further end of the deck, neither men nor things remained upright when they opposed his progress: there he took refuge in a sail, and although generally obedient to the voice of his master, force was necessary to make him quit the shelter of its folds. As to the Panther, his back rose in an arch; his tail was elevated and perfectly stiff; his eyes flashed; and, as he howled, he shewed his huge teeth: then, as if forgetting the bars before him, he tried



to spring on the Orang, to tear him to atoms. It was long before he recovered his tranquillity: day and night he appeared to be on the listen; and the approach of a large monkey we had on board, or the intrusion of a black man, brought a return of his agitation. We at length sailed for England with an ample supply of provisions; but unhappily, we were boarded by pirates during the voyage, and nearly reduced to a state of starvation. My Panther must have perished but for a collection of more than three hundred parrots, with which we sailed from the river, and which died very fast while we were in the N. W. trades. Sai's allowance was one *per diem*; but this was so scanty a pittance, that he became ravenous, and had not patience to pick off the feathers before he commenced his meal. The consequence was, that he became very ill, and refused even this small quantity of food. Those around him tried to persuade me that he suffered from the colder climate; but his dry nose and paw convinced me he was feverish, and I had him taken from the cage; when instead of jumping about and enjoying his liberty, he lay down and rested his head upon my feet. I then made three pills, each containing two grains of calomel. The boy who had the charge of him, and who was much attached to him, held his jaws open while I pushed the medicine down his throat. Early the next morning I went to visit my patient, and found his guard sleeping in the cage; and, having administered a further dose to the invalid, I had the satisfaction of seeing him

perfectly cured in the evening. On the arrival of the vessel in the London Docks, Sai was taken ashore and presented to the Duchess of York, who placed him in Exeter Change, to be taken care of till she herself went to Oatlands. He remained there for some weeks, and was suffered to roam the greater part of the day without any restraint. On the morning previous to the Duchess's departure from town, she went to visit her new pet, played with him, and admired his healthy appearance and gentle deportment. In the evening, when her Royal Highness's coachman went to take him away he was dead, in consequence of an inflammation on his lungs." \*

We have dwelt so long on the preceding *Felidæ*, that we can do little more than merely glance at a few of the remaining species, many of which are, however, highly interesting and beautiful. Sir Stamford Raffles has recently described a Sumatran species, the Rimau Dahan (*F. Macrocelis*), which in size nearly equals the Tiger: it is remarkable for its large irregularly square blotches on a grey ground. He has also mentioned another, which even exceeds the tiger in size, the Rimau Maug, with a tufted tail and a long mane, from which it would seem to be allied to the lion. The hunting leopard (*F. Jubata*), of Africa and India, appears to be the link which connects the *Felidæ* with the *Canidæ*, having the teeth, tongue, tail, and fur of the Cats, while the form of the head, the general contour of the

\* London's Mag. Nat. Hist.

body, the claws only partially retractile, and the docility and susceptibility of education, shew a marked affinity to the Dogs. Its fur, which is harsh, is fawn-yellow, studded with numerous simple black spots: a sort of thin mane rises on the neck and back. It is used for the chase. The Ocelots and Tiger Cats, (*F. Pardalis*, *Tigrina*, *Diardii*, &c.) are numerous and beautiful little creatures, inhabiting both continents, where they chiefly prey on birds and small quadrupeds. Our own island produces a wild Cat (*F. Catus*), of somewhat tigrine character, which is now pretty well ascertained to be a quite distinct species from our sleek parlour pet (*F. Domestica*). To the latter, notwithstanding the efforts of naturalists, no satisfactory parentage is yet assigned.

A group of smallish species are well defined from the other Cats by a stouter form, thicker fur, a short tail, and a tuft or pencil of black hair tipping the ears. They constitute the Lynxes, and though few in number, are found in North America, Europe, Asia, and Africa. They are arboreal and agile, and some of them are inured to a very severe temperature, such as the Canada and European Lynxes (*F. Canadensis*, and *F. Lynx*).

### III. AMPHIBIA.\*

Our attention has hitherto been given to those animals whose motions and functions have been performed in the atmosphere, either on the surface

\* Ἀμφίς, *amphis*, both ways, and βίωω, *bioo*, to live.

of the earth, or elevated a little above it. It is necessary that they be thus constantly bathed in air; for an interruption of the process of respiration, for only a few seconds, would cause instant death. But the tribe before us, the last of the *Carnaria*, is in its habits and motions essentially aquatic, and though its respiration is still exclusively aerial, yet it is suspended for long intervals, usually a quarter of an hour; and sometimes, as in a case witnessed by F. Cuvier, extending to an hour. Notwithstanding this peculiarity the blood is abundant and very hot; it is, however, also very black. Intended to pursue the fishes that glide so swiftly through the depths of ocean, the *Amphibia* are perfectly formed for this object; and while we find in them all the organs common to terrestrial animals, it is highly interesting to behold how beautifully and skilfully each is modified in form to correspond to the required change of habit. None can look upon a Seal, without being at once struck with its fish-like shape; the rounded chest tapering away to a point, which is the most favourable form for rapid progression in water. To counteract the chilling influence of the medium in which they dwell, the whole body is encased in a thick layer of highly elastic fat, which also resists the pressure of the superincumbent water at great depths, and renders the whole animal specifically lighter,—three very important purposes. The skin is clothed with thick, downy, wool; but as this would impede swift motion, it is covered with an outer coat of close, strong, shining hair. The

nostrils are closed at will; the orifice of the ear can also be closed; and the eye is furnished with a third eyelid, which can be drawn across it as a defence. The limbs are short, and almost enclosed within the body, little more than the feet projecting: the toes, however, being strongly webbed, render them very efficient as fins: and the hind pair, in particular, from their shape and position, have a strong resemblance to the broad horizontal tail of the Cetacea. In fact they answer the same purpose—that of sending up the animal rapidly to the surface, by a powerful vertical stroke. The feet are scarcely used in motion on land, where yet they move with considerable speed. The mode in which this is effected, is another of the interesting peculiarities of this tribe. The vertebræ of the spine are much more separated than usual, the connecting cartilages being much larger, allowing it great freedom of curvature, and the muscles which bend it are particularly strong. In moving forward the Seal arches its spine, bringing the hinder part forward, then pressing with the hind feet on the ground, straightens the body with a jerk; and by a repetition of such apparently awkward springs as these, it manages to get along at a good round pace.

There is some reason for believing that vegetables occasionally form the food of the true Seals; but their dentition is decidedly carnivorous, the molars being all trenchant, or conical, without any tuberculous part at all. The Walrus, on the other hand, the connecting link with the Herbivorous Mammalia,

has the molar teeth cylindrical, with flat crowns. The Amphibia thus separate into two genera, the Seal and the Walrus; the former of which is again divided, by the separation from it, of those Seals (called *Otaries*,) which have external ears.



WHIPPER.

THE HARP SEAL (*Phoca Grænlandica*), and the WALRUS (*Trichecus Rosmarinus*).

*Phoca,\* the Seal.*

Inhabiting the inaccessible retreats of ocean, landing chiefly on the iron bound coasts, or still more dreary ice-fields, of high latitudes, it was to be ex-

\* The Greek name of the Seal.

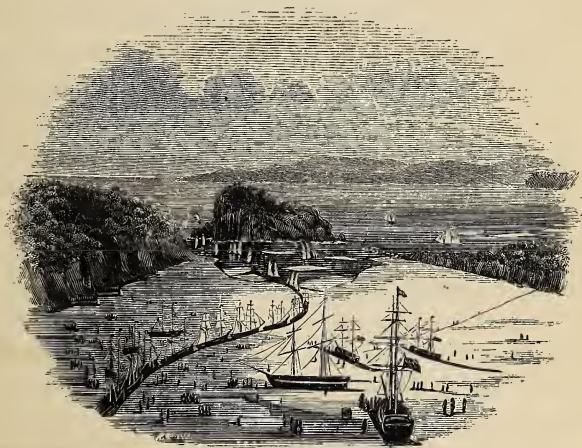


pected that this genus, extensive as it appears to be, should be comparatively little known to naturalists. Until very recently the recorded species presented an inextricable knot of confusion, which has now, however, been in some measure unravelled. It would ill comport with the design of this work, to follow the details of minute arrangement: we shall content ourselves with noticing the more prominent characters of the race as a whole. Though little known to science, the Seals have been long known to commerce; and the pursuit of the animals for their oil and skins forms no inconsiderable source of national wealth. Fleets of vessels of various sizes, manned by expert and hardy seamen, annually leave the shores of Europe and America, bound either for the Arctic Regions, the Coast of Newfoundland, or the desolate shores of extreme South America, whence they return, after long voyages attended with incredible hardships, loaded with the valuable products of the Seal. The sealing trade of the South Sea is confined to the ships of England and the United States.

A few notes of the Newfoundland "Seal-fishery," derived from personal inquiry and observation, during a residence of many years in that Island, may not be unacceptable. In the month of February, the sealing craft, usually schooners and brigs from sixty to one hundred and fifty tons, which had been laid up and partly dismantled all the winter, are prepared for the voyage, and by the first of March they are fitted out. The crew, according to the size of the vessel, varies from sixteen



to thirty-five hands, many of whom are provided with large guns, and the rest with stout clubs or "bats." Each man has also a "gaff," or pole, provided with a hook at the end, to assist him in leaping from pan to pan when among loose ice. From the 1st to the 10th of March they endeavour to get out, but it frequently happens that the harbours are frozen over to the depth of several feet. In this case the crews of all the vessels in the port unite to cut with ice-saws a broad channel through the midst of the harbour to the open sea; and as these united crews sometimes amount to two thousand men, it may reasonably be supposed that the broad icy plain displays a scene of no ordinary animation and excitement. Each individual craft has to make good its own passage into the common



A CUTTING OUT.

channel; and when all the labours are completed, and the vessels, to the number of a hundred or more, are arranged in single file, and, with all canvass set, and flags flying at every mast and peak, are rapidly sailing down the channel before a steady breeze in the presence of all the assembled inhabitants, the sight is most exhilarating. One by one issues from the narrow gorge into the open water, and soon all are seen scattered in the distance, and speckling the offing with their white sails, till they are gradually lost below the horizon. Each pursues its own course, according to the judgment of the master as to the position of the ice of which they are in search; those immense fields which, dislodged from the Arctic Regions in the preceding summer, have been through the winter pursuing a southerly direction. In some seasons these fields keep close to the land, blockading the whole coast as they proceed, while in others they form a loose and unconnected belt, running down at the distance of two or three hundred miles from land. We will suppose, however, that a day or two's run has brought the vessel to the edge of the field, on which myriads of Seals are discovered with their new-born young. The great majority are of one species, the Harp Seal (*P. Grænländica*), whose young, for the first two or three weeks, are covered with a dense coat of white wool, which drops off at the end of that period, and discovers the true fur, which is of a drab hue, variously spotted with black. The young in this earliest stage, when they are

called *Whitecoats*, are exceedingly fat, and the oil they produce is more abundant and more valuable. In this state, of course, they are incapable of resistance, and are killed by a slight blow with the *bat*. The gun is used only to shoot the old Seals, in case the time of obtaining the *whitecoats* should have passed without success. Another species is also found, though not in so great numbers, the Hood Seal (*P. Cristata*), which, though of larger size, is less valuable. As soon as a Seal is killed, and sometimes, we regret to say, even before, a circular cut is made with a sharp knife around the neck, and a longitudinal one down the belly to the tail: the skin with the surface fat is then "scalped" off, forming altogether "a pelt:" this alone is taken, the carcass being left upon the ice. The pelt of a young whitecoat has often three inches of fat, and weighs forty pounds. When three or four pelts are obtained they are laid one on another and dragged by a rope, the fur side being undermost, to the vessel, when they are thrown into the hold and stowed. The whole adventure is full of hazard; in the excitement of the pursuit, leaps of terrific risk are taken from field to field, across yawning chasms, whose terrors are scarcely noticed; and sometimes night draws on, when the excited hunter, then first made aware of its approach, discovers that he is many miles from his vessel, with no clue to guide his return across interminable ice-fields. With the setting sun the temperature has likewise rapidly gone down; and, perhaps, the bewildered

voyager has to pass the night on unsheltered ice, in an atmosphere at Zero. Frozen limbs are frequently the result of these exposures, and individuals in their attempts to return, often drop through holes and are seen no more. But this is not all; for sometimes a sudden change of wind will separate fields of ice on which the men are sealing, and ere they are aware, they are driving far out to sea, helpless and hopeless. But we will suppose none of these accidents to have happened, but that the hold being filled with pelts, the vessel returns to her port: this sometimes happens in the course of ten days from departure, but sometimes it is delayed for several weeks. Arrived, the Seals are landed at the wharf, where they were formerly received by tale; but of late years by weight, as the fairer mode. They are now to be skinned; for this purpose a man stands before the *skinning-table*, an inclined plane reaching from his middle to the ground. He seizes a pelt with his left hand, the fur being downward, then, with a sharp knife, edge outward, he boldly and dexterously cuts between the fat and the skin, the former rolling down in large and long masses, while the latter, though shaved clean, rarely receives a gash. A very expert hand will skin five hundred in a day. The fat as it is skinned is removed to a stage, where it is chopped into small portions, and then pushed into a vat beneath. Here it is allowed to remain, covered from the sun, until the advancing heat of spring melts the fat from the cellular tissue, which, when

the oil has been drawn off, is rejected under the name of *scrunchions*. The skins divested of fat, are salted in layers, in which state they are exported to England, to be used either as furs, or to be tanned into coarse leather. The value of pale seal oil in the island, may average 25*l.* per tun; and salted skins 50*l.* per thousand. A vessel of one hundred and twenty tons, will bring in five thousand young seals: which, averaging 6*s.* 6*d.* each, produces 1625*l.* Half of this is divided equally among the crew, who, however, pay from 20*s.* to 30*s.* each for their berth; the other half belongs to the owner, who if he be also master, receives a man's share besides. A hired master has no share, but usually receives 4*d.* or 6*d.* per seal, on the whole cargo. A few of the earliest discharged go out on a second trip, but this is rarely very productive, as by the middle of May, all must be home to prepare for the cod-fishery.

The Seal appears, from many authorities, to possess much intelligence, combined with docility, gentleness, and affection. Monsieur F. Cuvier gives some touching details of the manners of a Marbled Seal (*P. Discolor*), which was living in the royal menagerie. He says, "Except in some monkeys, I have never known any wild animal which was more easily tamed, or attached itself more strongly. When it first came to the Jardin des Plantes, it endeavoured to escape when I wished to touch it; but in a very few days all its apprehensions vanished; it had discovered my intentions, and rather desired my caresses

than feared them. It was in the same enclosure with two small dogs, which amused themselves by frequently mounting on its back, with barking, and even biting it ; and although these sports, and the vivacity of the attending movements, were little in harmony with its own actions and habits, yet it appreciated their motive, and seemed pleased with them. It never offered any other retaliation than slight blows with its paws, the object of which was to encourage, rather than repress, the liberties taken. If the puppies escaped from the enclosure, the Seal endeavoured to follow them. When the weather was cold, the three animals huddled closely and kindly together. It manifested no fear of man, nor attempted to avoid him, except to escape the being accidentally trodden upon. It would also suffer, without anger or resistance, the food which it was devouring to be forcibly taken away, even when hungry ; and that not only by man, but also by his canine playfellows. On the other hand, when their mess was supplied to the Seals, (for he had a companion,) as they lay in the same trough, a battle was the usual result, and blows with their paws followed, and, as usually happens, the more feeble and timid left the field to the stronger.”\*

Buffon gives testimony to the obedience and affection of an individual which he saw, but of another species (*P. Monachus*), the Monk Seal. This animal was, however, subject to paroxysms of blind and indiscriminate rage, probably arising from disease, during which it was violent and dangerous.

\* Mammifères,



This individual was accustomed to devour thirty pounds of living fish, usually eels, every day: these were more agreeable to its palate, when rolled in salt. It was seven feet and a half long.

Perhaps the most remarkable species of the tribe, as it is undoubtedly the most gigantic, is the Elephant Seal (*P. Proboscidea*). With the exception of the Whales, it is the largest living animal known to naturalists, sometimes attaining a length of thirty feet, with a thickness of eighteen. It delights in the barren and inhospitable islands which surround the southern Horn of America, on whose shores they lie in herds, wallowing their ungainly bulk and basking in the sun. The male has the snout produced into a sort of contractile proboscis, a foot in length when extended. The teeth are formidable, and the jaws powerful, yet they seem unconscious of their power, manifesting the mildness of their race. One individual will sometimes yield fifteen hundred pounds of oil of superior quality.

The many animals which have been described under the vague appellations of Sea-lion and Sea-bear, (*P. Jubata*, *Leonina*, *Ursina*, &c.) belong to the *Otaries* or Eared Seals. They do not exhibit sufficient peculiarities to require a separate description: they seem, however, more bold and fierce than those which we have noticed.

*Trichechus*,\* the *Walrus*.

The great peculiarity of this genus, which comprises but a single known species, consists in the

\* *Θρίξ*, *thrix*, hair.



enormous developement of the upper canines, and the consequent enlargement of the head. These are produced into tusks projecting downwards two feet in length, slightly curved, and diverging at the points. Their ivory is now generally considered superior to that of the elephant. In form, the Walrus (called also Morse, and Sea-horse) resembles the Seals, but is more bulky in its proportions; its habits are likewise similar, save that it appears to be herbivorous. It usually exceeds an ox in size, and sometimes attains to that of the elephant. It seems to be confined in its geographical range to the frozen seas of the northern hemisphere.



## ORDER IV.—MARSUPIALIA.\*

WHEN Linnæus attempted to organize and arrange the science of Natural History, an animal was known, which offered a remarkable deviation from the general structure. It was the Opossum of North America; and the peculiarity consisted in a pouch, or bag, on the abdomen of the female, into which the offspring was transferred at a very early stage of developement, and nourished as in a second womb. The subsequent discovery of the great continent of Australia laid open other species, and even genera, similarly formed; and it is a most remarkable fact that, of the terrestrial quadrupeds inhabiting that country, with which late researches have made us acquainted, amounting to nearly a hundred species already known, *almost all*, though varying among themselves in food, structure, and habits, yet are united together in one group, by many strongly marked characters, of which the most prominent is the abdominal pouch abovementioned. Cuvier, therefore, formed the whole into an assemblage, to which he, in the last edition of his work, assigned the rank of an order; but it may be proper to observe, that he himself saw its claims to be considered as a separate

\* *Marsupium*, a purse.

class, parallel with, but distinct from, the ordinary Mammalia. A more intimate knowledge of their anatomical structure, the result of much attention and study, has convinced most modern zoologists of the propriety of this separation; and the class or sub-class MARSUPIALIA, divided into its own orders, and including the *Echidna* and *Ornithorhynchus*, is now generally considered as intermediate between the viviparous and oviparous VERTEBRATA, leading, however, to the Reptiles, rather than to the Birds. For convenience' sake, however, we shall in a work like the present adhere to the arrangement of Cuvier.

We find in these animals great variety of structure, dentition, digestion, prehension, progression, food, &c., affording us parallels to the Carnivora, Insectivora, Herbivora, and Rodentia. The great peculiarity by which they are associated, is the premature birth of the young, which, when produced, is compared by Professor Owen (in the case of the great Kangaroo—*Macropus Major*) to an earth worm, in the colour and semi-transparency of the skin. The pouch into which it is transferred for protection, is formed by a doubling of the skin of the abdomen, the orifice of which is capable of being firmly closed. At this period it is perfectly helpless, though it can move its limbs. It remains in the pouch an indefinite time, several months at least, until it has attained a large size; and, even long after its exclusion, it occasionally returns into the maternal pouch for protection. The other points which mark the distinctness of this class of animals are found in

the circulatory system, the structure of the brain, of the skull, of the palate, and the number of the teeth.

With the exception of the single genus first known, the Opossum (*Didelphys*), containing between twenty and thirty species, which are found in North and South America,—the whole group is confined to Australia and the islands adjacent. They afford a singular instance of the isolation of a particular form, and a strong confirmation of the theory, that the centres of creation were not one, but many. They comprise animals of varying size, from the Red Kangaroo (*M. Laniger*) which attains the height of man, to the least Flying Squirrel (*Petaurus Pygmæus*) which is less than the mouse. It is said that no marsupial animal possesses a true voice; some of them when irritated, emit a sort of wheezing guttural sound: that of *Dasyurus Ursinus* approaches the nearest to a growl; that of the Wombat, is a hiss like that of a serpent: another point of resemblance to the Reptilia.

*Didelphys*,\* the Opossum.

The Opossums seem to approach nearer to the structure of ordinary mammals, than any other of the marsupial genera. They possess a well-developed opposable thumb to the hind feet, and the tail is prehensile. The pouch is in some species only rudimentary, though in others large and perfectly form-

\* Δύο, *duo*, two, and δελφύς, *delphys*, a womb.

ed. The teeth are fifty in number, thus arranged : incisors  $\frac{1}{8}$  ; canines  $\frac{1}{1}-\frac{1}{1}$  ; false molars  $\frac{3}{3}-\frac{3}{3}$  ; true molars  $\frac{4}{4}-\frac{4}{4}$  ; = 50. They are small animals ; from the size of a cat to that of a mouse ; active chiefly by night, when they run among the branches of trees, in search of birds, insects, and fruits. The common Opossum of the United States (*D. Virginiana*) is a good example of the genus. It is of a grey hue ; the fur thick and soft ; the mouth wide, the eyes small, the nose sharp and long ; the general form robust. It is remarkably tenacious of life, and has the unaccountable property (found in many of the insect tribes) of counterfeiting death, when attacked.

*Dasyurus*.\*

This genus contains the rapacious Marsupials, answering to the true Carnivora. The teeth are nearly as in the Opossum, but there are two incisors less in each jaw : and the molars are more trenchant. One section of the genus has but two false molars in each jaw on each side. The tail is thickly clothed with hair, and is not prehensile. There are three subgenera : *Thylacinus*,† *Dasyurus*, and *Phascogale*.‡ The first contains but one known species (*D. Cyncephalus*),§ an animal of Van Dieman's Land, about as large as a wolf, but rather lower ; greyish brown, with black stripes across the body, whence it is called

\* *Δασυς*, *dasys*, hairy, and *οὐρά*, *oura*, a tail.

† *Θύλακος*, *thylakos*, a bag.

‡ *Φάσκολος*, *phaskolos*, a pouch, and *γαλή*, *gale*, a weasel.

§ *Κύων*, *kyon*, a dog, and *κεφαλή*, *kephale*, the head.

by the colonists, Zebra Wolf, Native Tiger, Hyena, &c. It is but little known, but appears to be strong and fierce. The animal called Native Devil, (*D. Ursinus*,) belongs to the second division; it is as large as a badger, fierce, and destructive, but seems heavy and inactive. The third sub-genus comprises small species, less decidedly carnivorous, the smallest (*D. Murina*) being less than a mouse, while none exceed the size of a rat. They probably feed on insects.

Closely allied to the *Dasyuri*, are one or two little animals from Swan River, forming the genus *Myrmecobius*,\* which possess a greater number of teeth, than any other quadruped, with one exception. They are incisors  $\frac{4}{3}-\frac{4}{3}$ ; canines  $\frac{1}{1}-\frac{1}{1}$ ; false molars  $\frac{4}{3}-\frac{4}{3}$ ; true molars  $\frac{4}{4}-\frac{4}{4} = 52$ . Little is known of them.

### *Perameles*.†

A few pretty little animals are included in this genus, which shew an approach to the form of the Kangaroos: the teeth seem also to connect the carnivorous with the herbivorous genera. They feed on roots and insects. The name of Bandicoot is given to one species, (*P. Gunnii*,) by the inhabitants of Van Dieman's Land.

\* Μύρμηξ, *myrmex*, an ant, and βίω, *bioö*, to live.

† Πήρα, *pera*, a purse, and *meles*? a badger.



*Macropus,\* the Kangaroo.*COMMON KANGAROO (*M. Major*).

In addition to the remarkable structure of the whole order, the Kangaroos are distinguished for the great length and power of the hind limbs, and of the tail, the smallness of the fore limbs, and the general elegance of their form. The fore feet are scarcely used in progression, the animal moving by enormous leaps performed with the hind feet alone. Its usual posture is nearly erect, sitting upon the

\* *Μακρὸς*, *makros*, long, and *ποῦς*, *pous*, a foot.

long feet, and the stout base of the muscular tail: it has the power of balancing itself upon its tail alone, while it kicks out forward with both hind feet together, with great force. The teeth are essentially herbivorous; incisors  $\frac{6}{2}$ ; canines  $\frac{0}{0}$   $\frac{0}{0}$ ; false molars  $\frac{1}{1}$   $\frac{1}{1}$ ; true molars  $\frac{4}{4}$   $\frac{4}{4}$ : = 28. The Kangaroos chew the cud like the Ruminantia, though but to a very partial extent, to which order the formation of the stomach and intestines shews their analogy. They are also subject to the presence of hair-balls in the stomach.\* The nails on the hind toes are large and solid, resembling long hoofs. The expression of the countenance is gentle and pleasing; and, as well as its contour, resembles that of a deer.

Some particulars connected with the parturition of these animals have already been noticed in treating of the order; but there is one circumstance respecting the nutrition of the young, observed in the Kangaroo, which cannot be passed over. When the helpless progeny is first presented to the nipple, it is utterly incapable of the muscular effort of sucking; the mother is therefore furnished with a muscle which presses the nipple, and causes the milk to flow. The act of swallowing, however, might not always take place at the same instant as the injection, and the throwing of the fluid into the windpipe might be fatal. This danger is provided for, and obviated by an express contrivance; the air-passage is completely separated from the throat, and the milk passes down in a double stream on each side of the larynx

\* Pro. Zool. Soc. 1834, p. 152.

into the stomach; furnishing, as Professor Owen justly observes, “a most irrefragable evidence of creative foresight.”

The Kangaroos are all natives of New Holland and Van Dieman's Land,—where they inhabit the plains covered with long grass and bushes. They are not strictly gregarious, though many are often collected at one spot. The flesh is excellent and much prized; and therefore they are the objects of eager pursuit. “When hunted they will bound over gullies and down declivities the distance of thirty yards, and fly right over the tops of low brushwood; in such places dogs stand very little chance with them, but in a clear open country they soon tire them out. When a dog gets close to a large Kangaroo it will often sit on its tail and haunches and fight the dog, turning adroitly round and round, so as always to face him, and pushing him off with the fore paws; or it will seize and hug him like a bear, ripping him up with the long sharp claw of its powerful hind leg. They constantly cut and often kill dogs with this terrible weapon, which will tear out the bowels at a single kick.” About forty species are already known, a few of which, possessing canine teeth, have been separated by the name of *Hypsiprymnus*,\* the Kangaroo Rat or Potoroo. New species, however, are every year being added to our knowledge, as the interior of that vast continent becomes explored. They breed freely in confinement.

\* “Ὑψος, *hypsos*, height, and πρὺμνος, *prymnos*, behind.

*Phalangista*,\* the *Phalanger*.

These are arboreal animals with prehensile tails ; whose life is spent chiefly in roaming amongst the branches by night, seeking insects and fruit, and sleeping in the forks and hollows by day. They eat also the buds and young leaves of certain trees. Though their form is much modified, their structure shews a close alliance with the last genus, while in some particulars they approach the *Dasyuri*. They are scattered over the Australasian Continent and Archipelago ; few exceed the size of a cat. They include three sub-genera,—*Phalangista*, *Petaurus*,† and *Phascolarctos*,‡ which vary a little in their dentition, but are all marked by having the two inmost toes of the hind feet united.

The true Phalangers have a large tail, often bushy, but prehensile at the extremity: the teeth are, incisors  $\frac{3}{1} \frac{3}{1}$ ; canines  $\frac{1}{0} \frac{1}{0}$ ; false molars  $\frac{1}{1} \frac{1}{1}$ ; true molars  $\frac{4}{4} \frac{4}{4} = 30$ . Mr. Bell, in the transactions of the Linnean Society,§ has given some interesting particulars of the habits of a small species (*Phalangista Nana*) in confinement, which are said to have resembled those of the Dormouse.

The second division comprehends the Flying Phalangers, marked like the Flying Squirrels, which they

\* Φάλαγγξ, *phalanx*, [used for] a finger.

† Πετάω, *petao*, to unfold.

‡ Φάσκολος, *phaskolos*, a pouch, and ἄρκτος, *arktos*, a bear.

§ Vol. xvi. p. 121.

closely resemble, by an extension of the skin of the body from the fore to the hind legs, by means of which they are supported in the air during leaps of great extent from one tree to another. They can-



FLYING PHALANGER (*P. Sciurus*).

not really fly. They have three false molars in the upper jaw. The tail is well clothed with hair, which, in several species takes the feather-like arrangement seen in the Squirrels. The Sugar Squirrel and the Flying Mouse of the colonists, (*Petaurus Sciurus*, and *P. Pygmæus*,) are elegant little animals of this section.

The only species of the third division is the Koala, (*Phascolarctos Fuscus*,) the Native Bear of the colonists. It is about the size of a badger, entirely destitute of a tail: climbs trees in the manner of a bear: the female carries her young one on her back, for some time after it has left the pouch.

*Phascolomys,\* the Wombat.*

Closely allied in its dentition, and in its form, to the Rodentia, this animal seems to be the link which connects the chain of marsupials to the great chain of placental mammals, by this end, as the Opossums connected it by the other. It has no canines, and the two projecting incisors of one jaw meet those of the other at an angle, as in the Rat and Squirrel. The only species, (*Ph. Ursinus*), the Wombat, common to the continent and islands, is a sluggish, burrowing animal, much like a great guinea-pig, feeding chiefly on roots, and grass. The flesh is esteemed, though coarse in texture.

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We must here notice two very singular Australian animals, which were placed provisionally, by Cuvier, as a section of his somewhat heterogeneous order, Edentata. He gave them the name

## MONOTREMATA,†

from their possessing but a single passage out of the body, like Birds and Reptiles. More recent researches have, however, proved their connexion with the great order or sub-class now under review. They have not a developed pouch, it is true, but they have the

\* *Phaskolos*, a pouch, and *μῦς*, *mys*, a mouse.

† *Μόνος*, *monos*, single, and *τρεῖς*, *trema*, an opening.



marsupial bones, and they display many important agreements in their anatomy. They are, moreover, confined to the marsupial regions of Australasia. They are called respectively *Echidna*,\* and *Ornithorhynchus*.†

They are undoubtedly the lowest forms of Mammalia known, and are interesting as being the points at which this highly organized class of Vertebrata branches off to the inferior, Reptilia. The elaborate anatomical investigations of Professor Owen and other zoologists have discovered in them many affinities to that class, which were before little suspected. The mode of their generation was long a matter of much uncertainty, but it seems now pretty clearly established that they are ovo-viviparous, (the young being produced in eggs, which are hatched internally,) and that the infant animal is nourished by true milk,‡ injected by the muscular action of the nipple. The teeth are entirely wanting; the eyes are small; the ears destitute of an external conch; the muzzle is protruded into a long beak; the limbs are short, and adapted for digging: there are five toes to each foot armed with strong claws, and the hind feet have a supernumerary claw or sharp curved spur, the use of which is unknown.

\* 'Εχῖνος, *echinos*, a hedge-hog.

† "Ὀρνίς, *ornis*, a bird, and 'ῥύγχος, *rhynchos*, a beak.

‡ See Proc. Zool. Soc. for 1832, pp. 145, 180; 1833, pp. 30, 82; and 1834, p. 44.

THE PORCUPINE ANT-EATER (*E. Hystrix*).*Echidna.*

This animal, (*E. Hystrix*), the Porcupine Ant-eater, as it is called in the colonies, is readily distinguished by the upper parts of its body being clothed with a dense coat of spines like those of the hedgehog, but stouter. The rest of the body is covered with bristly blackish hair. The short but strong feet are furnished with enormous convex claws, which are most effective in burrowing. The flattened beak-like muzzle is covered with a thick naked skin; and the glutinous tongue is capable of being thrust out as in the true Ant-eaters, and for the same purpose. It appears to possess a truly reptilian power of abstinence. One which was in the possession of Messrs. Quoy and Gaimard refused all sustenance for a month after its capture, without appearing to suffer in its general health, though it

became thinner. It burrowed with very great rapidity. Messrs. Bass and Flinders inform us that one escaped from their dogs, by burrowing in the loose sand, not head foremost, but by sinking himself directly downwards, and thus presenting nothing but his prickly back to his adversaries.

Some interesting notes are given by Lieut. Breton, to the Zoological Society,\* of one which he was endeavouring to bring to England. "Previously to embarkation, this individual was fed on ant-eggs [pupæ?] and milk, and when on board, its diet was egg chopped small, with liver and meat. It drank much water. Its mode of eating was very curious, the tongue being used at sometimes in the manner of that of the chameleon, and at others in that in which a mower uses his scythe, the tongue being curved laterally, and the food, as it were, swept into the mouth: there seemed to be an adhesive substance on the tongue, by which the food was drawn in. The animal died suddenly, off Cape Horn, while the vessel was amidst the ice; perhaps in consequence of the cold, but not improbably on account of the eggs with which it was fed being extremely bad."

As the present work may fall into the hands of some of our intelligent countrymen who yearly emigrate to the lands where these singular animals abound; and considering the very great interest which attaches to the transmission of a living specimen to Europe, an object never yet accomplished,—it may not be amiss to quote a few hints added by Lieut. Breton, for this purpose, especially as he

is of opinion that with such precautions as these, little difficulty would be experienced. "Previously to embarkation, the animal should gradually be weaned from its natural food of ants; which may be done with great facility by giving it occasionally ants and ant-eggs, (the last is, in fact, more properly speaking, its common food,) but more generally milk, with eggs\* chopped very small, or egg alone. When on board ship it should be kept in a deep box, with strong bars over the top, and a door. It is requisite that the box or cage be deep, because the animal constantly tries its utmost to escape; and possessing very great strength, is liable to injure itself in its exertions to force its way through the bars. The effluvia arising from its excrement are so extremely fetid, that it cannot be kept altogether in a cabin, unless the cage be frequently cleaned. While this is being done, the *Echidna* may be allowed its liberty, but must be narrowly watched, or it will certainly go overboard. It is absolutely necessary that the eggs which are to constitute its food during the voyage be as fresh as possible: they can be preserved in lime-water. If milk is not to be procured, water must be supplied daily; and egg and liver (or fresh meat) cut small, should be given at least every alternate day; but when the weather will permit, it should be fed once a day. Half an egg, (boiled hard,) and the liver of a fowl or other bird will suffice for a meal. Finally, the animal should be kept warm, and well supplied with clean straw. It will be as well to nail two or three pieces of wood (battens)

\* Fowls' eggs of course are meant.

across the floor of the cage, to prevent the animal from slipping about when the ship is unsteady."

Some naturalists have described a second species, by the name of *E. Setosa*, chiefly distinguished by the fewness and shortness of the spines, which are imbedded in a dense fur: but whether it is really distinct, is uncertain.

*Ornithorhynchus, the Duck-bill.*



THE DUCK-BILL (*Ornithorhynchus Paradoxus*).

Still more singular and anomalous than the last, this little animal may well be esteemed the greatest of those treasures with which Australia has enriched zoology. From the apparent contradictions united in its formation, the first species of the genus described, (and the only one absolutely ascertained,) received the name *Or. Paradoxus*. It is nearly two

feet in length, with a rounded, flattened body, covered with short, soft fur, of a deep brown hue: it has a short, flat tail; very short legs, the toes united by a web, which in the fore feet spreads out considerably beyond the tips of the claws. This formation enables it to swim with ease and grace; but as it also burrows in the earth, the free part of the web folds back when thus engaged, and leaves the claws unincumbered. The muzzle is more developed and more beak-like than in the *Echidna*; very much resembling the broad flat bill of some of the Ducks, covered with a blackish skin, which overlaps at the edges, and folds back at the base into a broad margin. The place of molar teeth is supplied by eight broad horny excrescences, (two on each side of each mandible,) of an irregular form, which probably serve as grinders, but have no roots. The eyes are small but brilliant, and the orifice of the ear is readily detected by its opening and closing, in a living animal.

We have already alluded to the uncertainty of the mode of its reproduction; and the researches of G. Bennett, Esq., to clear up this mystery, are highly interesting and important. We cannot refrain from quoting some of the details of them given in the *Proceedings of the Zoological Society*,\* though want of space forbids us to transcribe the many amusing particulars contained in the more full and perfect statement of that gentleman himself, published in the *Society's Transactions*.†

\* 1834, p. 141.

† Vol. I. p. 229.



“Mr. G. Bennett’s observations were commenced on the 4th Oct. 1832, at Mundoona, in the Murray county, on a part of the Yas River running through the estate of Mr. James Rose. The *Water Moles*, (as these animals are called by the colonists,) chiefly frequent the open and tranquil parts of the stream covered with aquatic plants, where the steep and shaded banks afford excellent situations for the excavations of their burrows. Such expanses of water are by the colonists called “ponds.” The animals may be readily recognized by their dark bodies just seen level with the surface, above which the head is slightly raised, and by the circles made in the water around them by their paddling action. On the slightest alarm they instantly disappear; and indeed, they seldom remain longer on the surface than one or two minutes, but dive head-foremost with an audible splash, reappearing, if not alarmed, a short distance from the spot at which they dived. Their action is so rapid, and their sense of danger so lively, that the mere act of levelling the gun is sufficient to cause their instant disappearance, and it is consequently only by watching them when diving, and levelling the piece in a direction towards the spot at which they seem likely to reappear, that a fair shot at them can be obtained. A near shot is absolutely requisite; and when wounded, they usually sink immediately, but quickly reappear on the surface.”

After recording the capture of four or five individuals, interesting chiefly in the particulars observed on their dissection, the narrative proceeds:—

“ On the morning of the 7th Oct. Mr. G. Bennett proceeded, in company with a native, to the banks of the river to see the burrow of an *Ornithorhynchus*, from which the natives had taken the young during the previous summer. The burrow was situated on a steep part of the bank; and its entrance, concealed among the long grass and other plants, was distant rather more than a foot from the water's edge. Its whole extent was not laid open, the natives contenting themselves with digging down upon it at stated distances, their operations being guided by the introduction into the burrow of a stick, which indicated its direction. It took a serpentine course, and measured about twenty feet in length; the termination was broader than any other part, nearly oval in form, and strewn with dry river weeds, &c. From this nest the native stated that he had taken in the previous season (December) three young ones, about six or eight inches in length, and covered with hair. In addition to the entrance above spoken of, the burrows have usually a second below the surface of the water, communicating with the interior just within the upper aperture. After exhibiting this burrow, the native proceeded to explain the means employed in tracking the *Mallangongs*.\* He pointed out on the moist clay of the banks, foot-marks leading to a burrow, from the bottom of which, on inserting his arm, he drew forth some lumps of clay, which bore evident marks of the animal's recent passage. He declared, however, that the inhabitant was absent,

\* The name given to the animal by the natives.

and Mr. G. Bennett was induced, by this information to abstain from further investigation. A female specimen, shot in the evening of the same day, was found to have two *ova*, rather smaller than buck-shot, in the left *uterus*; and in this, as in all the other female specimens, much difficulty was experienced in finding the mammary glands. The contents of the cheek-pouches and stomachs always consisted of river insects, very small shell-fish, &c., comminuted and mingled with mud and gravel, which latter, Mr. G. Bennett suggests, may be required to aid digestion. River weeds were never observed to form part of the food; but Mr. George Mac Leay informed the author that, in a situation in which water-insects were very scarce, he had shot *Ornithorynchi* with river weeds in their pouches."

On the 9th Oct. "a living female was taken from a burrow and placed in a cask, with grass, mud, water, &c.; and in this situation it soon became tranquil, and apparently reconciled to its confinement. Hoping that he had now obtained the means, should his captive prove to have been impregnated, of determining the character of the excluded product, Mr. G. Bennett set out on his return for Sydney, on the 13th of October, carrying the living *Ornithorhynchus* with him in a small box, covered with battens, between which only very narrow intervals were left.

"The next morning, tying a long cord to its leg, he roused it and placed it on the bank of the river, in order to indulge it with a bathe; and a similar

indulgence was granted to it on the second day of its journey. On these occasions it soon found its way into the water, and travelled up the stream, apparently delighting in those places which abounded most with aquatic weeds. When diving in deep and clear water, its motions were distinctly seen; it sank speedily to the bottom, swam there for a short distance, and then rose again to the surface. It appeared, however, to prefer keeping close to the bank, occasionally thrusting its beak into the mud, from whence it evidently procured food, as on raising the head, after withdrawing the beak, the mandibles were seen in lateral motion, as is usual when the animal masticates. The motions of the mandibles were similar to those of a duck under the same circumstance. After feeding, it would lie sometimes on the grassy bank, and at others, partly in and partly out of the water, combing and cleaning its coat with the claws of the hind feet. This process occupied a considerable time, and greatly improved its sleek and glossy appearance. After its second excursion it was replaced in the box, which was not opened again until the following morning, when it was found to have made its escape."

" On the 28th December the author visited a part of the Wollondilly River in the neighbourhood of Goulburn Plains, called by the natives Koroa, in order to explore the burrow of an *Ornithorhynchus*, which had there been discovered. The termination of this burrow was thirty-five feet from the entrance ;

and Mr. G. Bennett states that burrows have been observed of even fifty feet in length. It was found to contain two young specimens of the dimensions of ten inches from the beak to the extremity of the tail. The nest consisted of dry river weeds, the *epidermis* of reeds, and small dry fibrous roots, strewed over the floor of the terminal cavity. An old female was captured soon after on the banks of the river, in a ragged and wretched condition, which was conjectured to be the mother. But little milk could be pressed from her abdominal glands, as might have been expected in the parent of such well-grown young ones. She died at Mittagong on the 1st of January, but the young ones survived until some time after their arrival in Sidney.

“ Mr. G. Bennett proceeds to describe in detail their habits in a state of captivity. Their various attitudes when in a state of repose are curious:—the most favourite posture of the young animals appears to be lying rolled up in a ball; this is effected by the fore paws being placed under the beak, with the head and mandibles bent down towards the tail, the hind paws crossed over the mandibles, and the tail turned; thus completing the rotundity of the figure. The young were allowed to run about the room; but the old one was so restless, and damaged the walls of the room so much by her attempts at burrowing, that it was found necessary to confine her to the box. During the day she would remain quiet, huddled up with her young ones; but at night she became very restless,

and eager to escape. The little ones were as frolicsome as puppies, and apparently as fond of play; and many of their actions were not a little ludicrous. During the day they seemed to prefer a dark corner for repose, and generally resorted to the spot to which they had been accustomed, although they would change it on a sudden, apparently from mere caprice. They did not appear to like deep water, but enjoyed exceedingly a bathe in shallow water, with a turf of grass placed in one corner of the pan: they seldom remained longer than ten or fifteen minutes in the water at one time. Though apparently nocturnal, or at least preferring the cool and dusky evening to the glare and heat of noon, their movements in this respect were so irregular as to furnish no grounds for a definite conclusion. They slept much, and it frequently happened that one slept while the other was running about, and this occurred at almost all periods of the day. They climbed with great readiness to the summit of a book-case, placing their backs against the wall, and their feet against the book-case; and thus, by means of their strong cutaneous muscles, and of their claws, mounting with much expedition to the top. Their food consisted of bread soaked in water, chopped egg, and meat minced very small; and they did not seem to prefer milk to water. One of the young ones died on the 29th January, 1833, and the other on the 2nd February, having been kept alive in captivity for nearly five weeks."





SQUIRREL (*Sciurus Vulgaris*), and HARVEST MOUSE (*Mus Messorius*).

#### ORDER V.—RODENTIA.\*

THE order before us, strongly defined and perfectly natural as it is, is one calculated to annoy the zoologist in his attempts to dove-tail it into a harmonious system. Widely separated from other orders, it appears to manifest very few of those deviations from the typical structure that often connect, by almost imperceptible gradations, forms which, considered alone, possess little mutual re-

\* *Rodens*, gnawing.

semblance. Some bear a slight likeness to the insectivorous *Carnivora*, as the Mouse to the Shrew, and the Porcupine to the Hedgehog; while some of the more tall and elegant of the Agoutis seem to look towards the smaller Musks and Antelopes in the *Ruminantia*. But these are the resemblances of analogy, rather than of affinity. Perhaps, however, a true affinity exists between the Aye-aye (*Cheiromys*\* *Madagascariensis*), and the *Quadruman*, inasmuch as it possesses thumbs to the hind feet, together with other peculiarities; and the Capybara leads to the *Pachydermata*.

The great character of the order is, the presence of two long projecting incisors in each jaw, meeting in an angle, separated from the molars by a long space, which is unoccupied by canines. Their function is as singular as their form; it is evident they are not adapted for tearing prey, nor for cropping herbage; but their office is to reduce, by continual abrasion,—gnawing, or nibbling,—the substances on which they feed, into minute atoms. They are thus enabled to feed on very hard substances, such as the bark of trees, and to file away the still harder shells of many nuts and seeds. The incisors are coated with enamel only in front; the inner part, therefore, wears down faster than the outer, and thus they are always sharp, sloping with a chisel-like edge. They have no roots, but grow continually; so that if one be accidentally lost, the opposite one being now unworn grows out in a monstrous manner.

\* *Xειρ*, *cheir*, a hand, and *μῦς*, *mys*, a mouse.

The jaw has no lateral or grinding motion, but one forward and backward; the molars, therefore, have transverse crowns. Most of the genera are frugivorous or omnivorous; a few, however, shew a tendency to a carnivorous habit. The hinder parts are generally the most developed; many leap rather than walk. Most of the anatomical details of their structure, and especially the form of the brain, indicate their intellectual and physical inferiority, though some certainly possess much foresight and dexterity. The species enjoy a very extensive geographical range, but seem to predominate chiefly in America.

*Sciurus,\* the Squirrel.*

Of this extensive and widely-spread genus, our own elegant little species, (*S. Vulgaris*), the playful and beautiful tenant of our beech-woods, the lively but gentle pet of our houses, affords the best example. Living almost wholly in the trees, where it eats nuts, acorns, &c., it climbs and leaps from bough to bough with bird-like agility and precision. Its amusing mode of eating, sitting on its haunches, and holding its food in its fore-paws, its ingenious and cosy nest, its shadowing tail, its winter hoards of grain and mast; these are well known, and are characteristic of the tribe.

Many of the foreign species, such as those from North America, (*S. Cinereus*, *S. Capistratus*, &c.) and the great Indian Squirrel (*S. Maximus*), as

\* Σκιά, *skia*, a shade, and οὐρά, *oura*, a tail.

large as a cat, have their ears destitute of the little tuft of pencilled hairs which marks our species. Those which rarely climb trees, but live in holes in the earth, and have cheek pouches, usually called Ground Squirrels, are separated to form the genus *Tamias*.\* The fur is usually marked with several black stripes down the back.

The Flying Squirrels (*Pteromys*†), also of Europe and North America, form a separate division. They are enabled to take very long horizontal leaps, by the aid of a membrane, extended between the fore and hind legs.

The Ground Squirrels, with cheek pouches, lead naturally to the Marmots (*Arctomys*‡), in which we no longer find the elegant lightness of the former genus; while the Dormice (*Myoxus*§) are evidently an intermediate form between the Tree Squirrels and the Mice. The large and hairy tail, the form of the teeth, and the climbing and hoarding habits, shew this affinity. The pretty little tawny Dormouse of our own forests (*M. Avelanarius*), and the Fat Dormouse of the South of Europe (*M. Glis*), the celebrated delicacy of the Romans, by whom it was fattened for the table, are examples.

\* Ταμίας, *tamias*, a steward.

† Πτερόν, *pteron*, a wing, and μῦς, *mys*, a mouse.

‡ Ἀρκτος, *arktos*, a bear, and μῦς, *mys* a mouse.

§ Μῦς, and ὀξύς, *oxy*s, sharp.

Passing by several sub-genera, which we have not space to notice, we come to the genus

*Mus*,\* *the Mouse*.

This very numerous and widely extended group of small, but troublesome and destructive, animals is too well known to need much description. Their grinders are tubercled, indicating an omnivorous appetite, and their tails are usually naked and scaly. The larger species are usually styled Rats, and are very bold and intrusive. Some of the species confine themselves to the habitations of man; such as the House Mouse (*M. Musculus*), and the common Brown Rat (*M. Decumanus*), while others, more timid, reside in the fields, and feed on grain, roots, &c., as the Field Mouse (*M. Sylvaticus*), and the little Harvest Mouse (*M. Messorius*).

There are some elegant and agile little Mice in Africa, India, and North America, which have the hind feet much developed, and which elevate themselves, and leap in the manner of the Kangaroos. In America they are called Deer-mice. They form the genus *Dipus*,† the Jerboa.

We can do no more than allude to the Hamsters (*Cricetus*),‡ and the Voles, or Water-rats (*Arvicola*),§ through which we approach Castor, the Beaver.

\* Its Latin name.

† Δύο, *duo*, two, and πούς, *pous*, a foot.

‡ Κρίζω (?) *krizo*, to cry out.

§ *Arvum*, a field, and *colo*, to inhabit.

*Castor,\* the Beaver.*

In many respects the Beaver is an interesting animal. Its habits are typical of the order: its anatomical structure, in some respects, allies it to the monotrematous animals of New Holland; a secretion from its body is used in medicine, its fur is very valuable, and of all animals it exhibits the

THE BEAVER (*Castor Fiber*).

greatest ingenuity, skill, and perseverance, in constructing its habitations. Dull and stupid in appearance, it resembles a monstrous rat, distinguished, however, by a broad flat tail of very peculiar struc-

\* Its Greek name.



ture, covered with a black, dry skin, raised in the form of scales. There are five toes on each of the feet.

There is but a single species (*C. Fiber*) inhabiting the rivers of Europe and North America. Swimming and diving with great ease, a great part of its existence is passed in the water, on the banks of which, associating in companies, it displays those architectural instincts of which we are about to speak. Choosing a piece of water sufficiently deep to be unfrozen in winter, a running stream if possible, the Beavers fell young trees on the bank above the place, and float them down. They then form a dam composed of branches, twigs, stones, and clay, which is increased every year, and soon forms a strong and solid wall, and keeps the water at an even height. Above this dam, each family constructs a hut of similar materials, having an aperture under water, in and around which they store up vast quantities of young twigs, and bark of trees, for the winter's sustenance. The stories told of the distribution of labour among them, the superintendence of an overseer, who gives orders with his tail, the driving of huge stakes into the ground, the drawing of materials upon the tail, the using of it as a plastering trowel, and such like, are absurd and fabulous.

The use which is made of their fine and soft fur, in the manufacture of hats, causes the skins of these animals to be an important item in our North American fur trade. From the eagerness with which they have been pursued, they are now become scarce,

except in the interior, and in high latitudes, though they are still found even as far south as the Gulf of Mexico. The author of this work has seen the Beaver on the Alabama River, and in the streams of Newfoundland, and can from experience confirm the testimony of Cartwright to the delicious flavour of its flesh, at least in the latter locality.

Of its amusing, though sober manners in a state of captivity, we are happy to be able to quote again from the pleasant pen of Mr. Broderip: "The animal arrived in this country in the winter of 1825, very young, being small and woolly, and without the covering of long hair which marks the adult Beaver. It was the sole survivor of five or six which were shipped at the same time, and it was in a very pitiable condition. Good treatment quickly restored it to health, and kindness soon made it familiar. When called by its name, 'Binny,' it generally answered with a little cry, and came to its owner. The hearth-rug was its favourite haunt, and thereon it would lie stretched out, sometimes on its back, sometimes on its side, and sometimes flat on its belly, but always near its master. The building instinct shewed itself immediately it was let out of its cage, and materials were placed in its way; and this before it had been a week in its new quarters. Its strength even before it was half-grown, was great. It would drag along a large sweeping-brush, or a warming-pan, grasping the handle with its teeth so that the load came over its shoulder, and advancing in an oblique direction till it arrived at the point where it wished to place it.

The long and large materials were always taken first, and two of the longest were generally laid cross-wise, with one of the ends of each touching the wall, and the other ends projecting out into the room. The area formed by the crossed brushes and the wall, he would fill up with hand brushes, rush baskets, books, boots, sticks, cloths, dried turf, or anything portable. As the work grew high, he supported himself on his tail, which propped him up admirably, and he would often, after laying-on one of his building materials, sit up over against it, appearing to consider his work, or, as the country people say, 'judge' it. This pause was sometimes followed by changing the position of the material 'judged,' and sometimes it was left in its place. After he had piled up his materials in one part of the room, (for he generally chose the same place,) he proceeded to wall up the space between the feet of a chest of drawers which stood at a little distance from it, high enough on its legs to make the bottom a roof for him; using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or anything he could pick up. This last place he seemed to appropriate for his dwelling; the former work seemed to be intended for a dam. When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, cloths, hay, cotton, &c., to make a nest; and when he had done, he would sit up under the drawers, and comb himself with the nails of his hind feet.

“ Binny generally carried small and light articles

between his right fore leg and his chin, walking on the other three legs; and large masses which he could not grasp readily with his teeth, he pushed forwards, leaning against them with his right fore paw and his chin. He never carried anything on his tail, which he liked to dip in water, but he was not fond of plunging in the whole of his body. If his tail was kept moist, he never cared to drink; but if it was kept dry, it became hot, and the animal appeared distressed and would drink a great deal.

“Bread, and bread and milk, and sugar, formed the principal part of Binny’s food; but he was very fond of succulent fruits and roots. He was a most entertaining creature, and some highly comic scenes occurred between the worthy, but slow, Beaver, and a light and airy Macauco that was kept in the same apartment.”\*

The Beaver is affectionate and constant in his attachment: several instances are recorded in which one pined away, in consequence of the loss of a companion.

There is an animal of South America which much resembles the Beaver in appearance and habits, but with a rat-like tail. It is the Couia (*Myopotamus*† *Coipus*). Its fur is equally valuable.

\* Gardens and Men. of Zool. Society, vol. i. p. 167.

† *Mūs*, *mys*, a mouse, and *πόταμος*, *potamus*, a river.

*Hystrix,\* the Porcupine.*

Being a native of Europe, the common Porcupine (*H. Cristata*) has been long familiar, and is readily distinguished by its peculiar covering, which consists of a great number of hollow tubes, hard and brittle, and tapering to a fine point. Those on the tail, however, are open at the ends, as if cut off, and



THE COUENDO (*Hystrix Prehensilis*).

being slenderly attached to the skin, make a rattling noise when the animal shakes himself. It is a vulgar opinion that the animal has the power of shooting these quills at his enemies, but this is altogether

\* "Ἵστριξ, *hystrix*, the Greek name of the animal, "bristly," "hog-haired."

unfounded. The quills are prettily marked with alternate rings of black and white. The upper parts of the head and neck are furnished with a curved crest of long stiff hairs. It is a quiet, harmless animal, burrowing by day, and feeding on roots, &c., by night; but displays a very low degree of intelligence. There are several species allied to this,



THE URSON (*Hystrix Dorsata*).

but less spinous, some from South America, with a prehensile tail, one from North America, also a climber, and one from India with a singular tuft at the end of the tail.

*Lepus,\* the Hare.*

This well-known genus is remarkable for having two smaller incisors behind the principal ones in the

\* Its Latin name.



upper jaw. The ears are long, the inside of the mouth, and the soles of the feet and toes, are hairy, the tail short and erected. Our common Hare (*L. Timidus*), like most of the genus, is a solitary animal, while the Rabbit (*L. Cuniculus*), on the contrary, associates in large troops, dwelling in burrows. “The



THE RABBIT (*Lepus Cuniculus*).

prevailing colour is a mixture of grey and reddish brown; in some the principal colour is fulvous, in others the grey predominates. The admirable wisdom which assigns such colours as these to a group of animals which conceal themselves in the brown sombre vegetation of heaths and woods, will appear more striking when it is recollected that certain species, inhabiting the snowy regions of the north, become wholly white in the winter.”\*

\* Bell, Brit. Quad. p. 334.

The food of the whole tribe is exclusively vegetable ; in their manners they are gentle, but excessively timid, and perhaps no species more so than our common Hare, whose speed, heightened almost to madness by the agony of its fear, has given so keen a relish to the excitement of the chase. Yet, as the author above-quoted justly observes, “mercy and humanity can scarcely consist with the ardent love of a sport, the whole interest of which depends upon the intense exertion to which a helpless and defenceless creature can be driven by the agonies of fear and desperation.”\* Four species are inhabitants of the British Islands.

*Hydrochoerus,† the Capybara.*

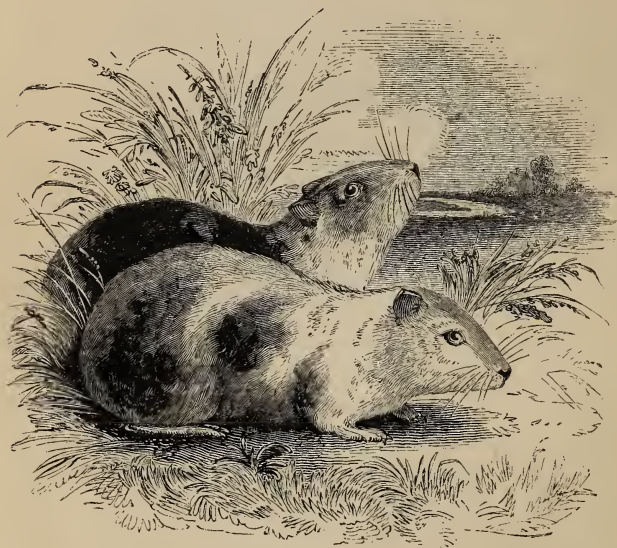
This animal is interesting because it possesses peculiarities in the teeth, too technical to be detailed here, which ally it with the *Pachyderms*. It is, moreover, the largest of the Rodentia, and has in some degree the clumsiness of form, and the tendency to produce superficial fat, which mark many of the thick-skinned tribes. Linnæus even placed the only species known (*H. Capybara*) in the Hog genus. It associates in troops, inhabiting the borders of the great South American rivers ; and its fondness for the water is another point of resemblance to the tribes above-named. Its flesh is highly esteemed. It is said to feed upon fish, which it catches with its feet and teeth, but this seems

\* Bell, Brit. Quad. p. 336.

† “ῥῥωγ, *hydor*, water, and χοῖρος, *choiros*, a hog.

quite inconsistent with the general habits of the Order: it does not refuse, however, fruits, corn, and sugar-canes. It is inoffensive in its disposition, and manifests considerable docility and affection, if reclaimed young.

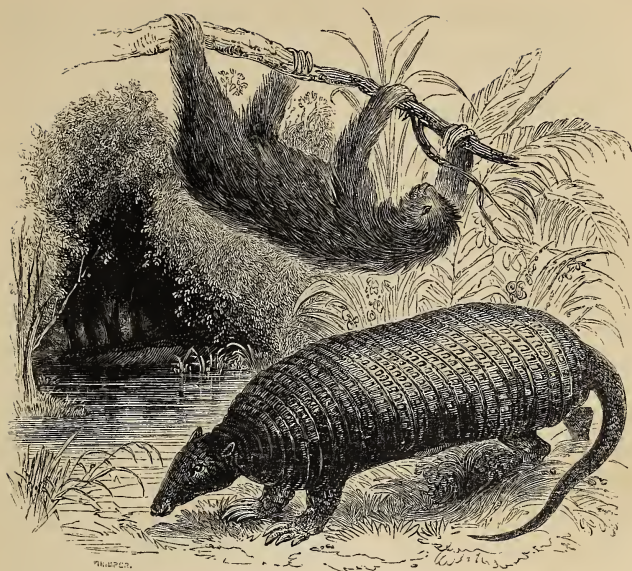
The Cavies (*Acœma*\*) are similar in form, but much diminished in size. The harmless and pretty little Guinea-pig, so remarkable for its abundant



THE GUINEA-PIG (*Cavia Cobia*).

fertility, is of this genus, but is not known in a wild state. It is certainly of American origin.

\* Α, without, and οἶμα, oima, force.



THREE-TOED SLOTH (*Bradypus Tridactylus*), and GIANT ARMADILLO (*Dasypus Gigas*).

#### ORDER VI.—EDENTATA.\*

A NUMBER of very dissimilar animals are united, by Cuvier, into one order under the above title, some of which seem to have little relation to each other. The *Monotremata* have been already considered. The characters which distinguish the order, are the absence of incisor teeth, and the developement of the nails into large hoof-like claws, in some species, of enormous size and strength. They are generally slow and sluggish in their movements, ungainly and

\* *E*, priv. and *dens*, a tooth.

repulsive in their form: the great majority of them feed on insects, chiefly on ants, but the Sloths appear to be fruit-eaters. South America is the home of most of the order.

*Bradypus,\* the Sloth.*

Strange and uncouth in appearance, slow in motion, and most singular in structure, the Sloths have been selected by short-sighted philosophists of the French school, as examples on which to found an arrogant denial of the wisdom or benevolence of God. Seeing an animal differing in its conformation from those with which they were familiar, they at once leaped to the illogical conclusion, that, because they in their ignorance *saw not* the use of certain organs, therefore they were “useless,” their possessor “miserable,” and their Creator a “BUNGLER!” A little more acquaintance with these creatures has, “justified the ways of God,” whose wisdom is unsearchable. As the errors concerning them, however, are still repeated in books of natural history, it may not be amiss to shew the true state of the case. The Sloth (the libellous name is, we fear, too generally adopted, to be now altered,) has been viewed *on the ground*, on which it can scarcely move, and adjudged defective because awkward in a situation for which it was never intended. The fore legs are nearly twice as long as the hind (reminding us of the Apes); the foot cannot be placed on the ground so as to rest on the

\* *Βραδύς*, *bradys*, slow, and *πούς*, *pous*, a foot.



sole, but on the edge, and the toes are armed with immense claws, long, sharp, and curved inwards. The claws of the Cat are, in a state of rest, drawn backwards, and can be bent downward only by muscular effort; but the claws of the Sloth are habitually bent down upon the wrist, and can be raised only by an effort, and that only in a slight degree: they are longer than the whole sole of the foot. It is no more adapted, therefore, for running on the branches of trees, than for walking the earth. Where then does it live? Mr. Waterton informs us, from his own personal observation during his "Wanderings in South America." "The Sloth in a wild state spends its whole life in the trees, and never leaves them, but through force or accident; and what is more extraordinary, not *upon* the branches, like the squirrel and monkey, but *under* them. He moves suspended from the branch, he rests suspended from the branch, and he sleeps suspended from the branch. Hence his seemingly bungled composition is at once accounted for; and in lieu of the Sloth leading a painful life, and entailing a melancholy existence on its progeny, it is but fair to conclude that it just enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence."—"The Indians have a saying, that when the wind blows, the Sloths begin to travel. In fact, during calm weather they remain tranquil, probably not liking to cling to the brittle extremities of



the branches, lest they should break while the animals are passing from one tree to another; but as soon as the wind rises, the branches of the neighbouring trees become interwoven, and then the Sloth seizes hold of them, and pursues his journey in safety. He travels at a good round pace, and were you to see him, as I have done, passing from tree to tree, you would never think of calling him a Sloth.”\* The stomach of these animals is very complex; though it does not chew the cud, and, contrary to what usually prevails in herbivorous tribes, the intestines are extraordinarily short. Probably the length of time the food is compelled to remain in the stomach compensates for this. The Three-toed Sloth was long believed to be a solitary exception to the general rule, that Mammals have but seven joints in the neck: but the two which appeared supernumerary in this instance have been proved by Mr. Bell to belong really to the back. Still these vertebræ, though on account of possessing rudimentary ribs they must be reckoned as in the back, are to all practical purposes in the neck, and afford a very beautiful proof that Divine wisdom and beneficence have been as freely manifested to the Sloth as to other animals. Its habitual position, already alluded to, rendered it necessary that, in order to see the ground to guard against enemies, &c., the neck should be capable of very great flexion, and to effect this two additional points of motion are granted, without breaking the normal number allotted to the

\* Wanderings, 1825, 4to. p. 165.

neck. The hair is coarse, and of singular texture, like withered grass, patched with light and dark brown, and no doubt aids its concealment among the grey tree-moss, (*Usnea*, &c.,) which so abundantly streams from the trees in its native forests. Notwithstanding the rigidity and awkwardness of the limbs, the fore-foot is used to convey food to the mouth. The *mammæ* are placed on the breast; and the solitary young one clings to the body of the parent in her peregrinations, till strong enough to provide its own living. The stories told of their stripping a tree even of its leaves, rather than undergo the exertion of removing, and then, to be consistent, letting themselves drop off, though repeated even by Cuvier, are absurd and unworthy of confutation. There are two or three species, all natives of South America, the best known of which are the Three-toed and the Two-toed Sloths (*B. Tridactylus* and *B. Didactylus*). They are also known by the native names of Ai and Unau. The former is the species to which we have chiefly alluded; it is about as large as a cat. The other is rather larger, but bears a great resemblance to its relative.

Intermediate between these animals and the succeeding, probably came two gigantic creatures, which inhabited this earth in a former state, but of which only the fossil remains are now found:—the *Megatherium*,\* which was twelve feet long, and seven high, and the *Megalonyx*,† which was probably little

\* Μέγας, *megas*, great, and θηρίον, *therion*, a wild beast.

† Μέγας and ονύξ, *onyx*, a nail.

less. It is believed that they were clothed with a scaly shield, like the Armadillo: the claws were of enormous size.

*Dasypus,\* the Armadillo.*

The very singular covering with which these animals are furnished, has been well compared to a number of little paving stones, forming a suit of shelly armour over the body, possessed, however, of considerable flexibility from the number of the joints. The number of teeth varies much, for while one species, the Ninebanded (*D. Novemcinctus*), has but twenty-eight, another, the Giant Armadillo (*D. Gigas*), has the unrivalled number of ninety-six. They feed on vegetables, or on insects; and will not reject carrion. They burrow with great readiness and ease, and run quickly, but in an odd manner. No one can have observed those in the Zoological Gardens scuttling along, without having been struck with the singularity of their motion. This is not altogether owing to the nature of their covering, but to the formation of the spine. The spinous processes, or projections from the joints of the backbone, do not converge to one point or centre of motion as they do in those animals which have great flexibility of body: but “the progressive motion of such animals is automaton-like; the legs seem to go by means of machinery, the action of which affects no other part of the body. No inflexions of the spine accompany the movements of the limbs;

\* *Δασύς*, *dasys*, hairy, and *πούς*, *pous*, a foot.

the two extremities of the vertebral column are not alternately raised and lowered as in the bounding Leopard ; but the back preserves its uniform level, however rapid may be the motion of the limbs.”\*

Mr. Waterton says that the Armadillo “burrows in the sand like a rabbit. As it often takes a considerable time to dig him out of his hole, it would be a long and laborious business to attack each hole indiscriminately, without knowing whether the animal were there or not. To prevent disappointment, the Indians carefully examine the mouth of the hole, and put a short stick down it. Now, if on introducing this stick, a number of mosquitoes come out, the Indians know to a certainty that the Armadillo is in it: wherever there are no mosquitoes in the hole, there is no Armadillo. The Indian having satisfied himself that the Armadillo is there, immediately cuts a long and slender stick, and introduces it into the hole; he carefully observes the line the stick takes, and then sinks a pit in the sand to catch the end of it: this done, he puts it further in the hole, and digs another pit, and so on, till at last he comes up with the Armadillo, which had been making itself a passage in the sand till it had exhausted all its strength through pure exertion. I have been sometimes three quarters of a day in digging out one Armadillo, and obliged to sink half a dozen pits, seven feet deep, before I got up to it. The Armadillo swims well in time of need, but does not go into the water by choice.”†

\* W. C. L. Martin, Quad. p. 64.

† Wanderings, p. 179.

In these animals we have another interesting instance of a remarkable form being confined to a particular locality; they inhabit South America alone, and seem, as it were, cut off from the other races of creation, no animals of the old world resembling them. There is, however, in their own country, a singular little creature lately discovered, (*Chlamyphorus\* Truncatus*,) which bears on its back, *over the skin and fur*, a cloak of plated-mail, of a leathery texture, attached only along the spine. Beneath the free sides, it is said, the young are sheltered, when burrowing in the earth.

*Orycteropus,† the Aard-vark.*

The Aard-vark (Earth-pig) of the Cape of Good Hope, (*O. Capensis*,) is the nearest representative of the above animals, but it has nothing answerable to their shelly covering. It is a plantigrade animal, as large as a badger, something like a short-legged, prick-eared pig: the tongue is flat and thin, but long and covered with glutinous slime as in the Ant-eaters, being used for the same purpose. The structure of the teeth is very curious, like short pieces of cane cut off, with a multitude of little pores running through their length. “Slow of foot, and a bad runner, it is never by any chance found abroad during the daytime. On the approach of night it sallies forth in search of food, and repairing to the nearest ant-hill, scratches a hole in the side of it just

\* Χλαμύς, *chlamys*, a cloak, and φέρω, *phero*, to bear.

† Ὀρύσσω, *orysso*, to dig, and ποῦς, *pous*, a foot.

sufficient to admit its taper snout. Here, having ascertained that there is no danger of interruption, it lies down, and inserting its long slender tongue into the breach, entraps the ants, which, mounting on the tongue of the Aard-vark, adhere to the glutinous saliva, and are thus swallowed in vast numbers."

*Myrmecophaga,\* the Ant-eater.*

The habits of the Aard-vark may be considered as those of this genus; which, however, comprises animals possessing even greater length of muzzle and tongue, and utterly destitute of teeth. The claws are large, strong, and trenchant, and with them it is said the Great Ant-eater, (*M. Jubata*,) which is more than four feet long, defends himself even against the Jaguar. They are all natives of South America, and appear to be represented in the old continent by the genus

*Manis, the Pangolin.*

These are, like the last, destitute of teeth, have a long, extensile, viscous tongue, and prey on ants; but they are clothed with large sharp-edged scales, free at the edges, lapping over each other like tiles, which being elevated when the animal rolls himself in a ball for self-defence, present an array as formidable as the spines of the Porcupine. There are two species, inhabiting respectively India and Western Africa.

\* Μύρμηξ, *myrmex*, an ant, and φάγω, *phago*, to eat.





WART-HOG (*Phacochoerus Æthiopicus*), INDIAN RHINOCEROS (*Rhinoceros Indicus*), and RIVER-HORSE (*Hippopotamus Amphibius*).

#### ORDER VII.—PACHYDERMATA.\*

HITHERTO we have considered animals whose toes and fingers have been free and flexible, though in very different degrees; their extremities have been furnished with nails, varying in shape from the small flat nail of man and the ape, to the immense hoof-like claws of the burrowing *Edentata*. The power of seizing now entirely disappears, even

\* Παχὺς, *pachys*, thick, and δέρμα, *derma*, skin.

in that very subordinate degree necessary for digging the soil; the limbs are merely supporters of the body, and their extremities are enclosed in hollow, horny, box-like, insensible hoofs.

The Order before us, the first of the Ungulate or Hoofed Animals, contains the largest of all the terrestrial creatures. They are characterized by the thickness of their tough and leathery skin, and the want of a ruminating stomach, though their natural food is wholly vegetable. Most of them are but thinly clothed with hair, and some are almost entirely destitute of it, having only a few scattered bristles. The impenetrable character of the hide is thus needful to protect them from the maddening punctures of the venomous ticks and flies, which swarm in the sultry regions of the Tropics. For the same reason they seek refuge, during the burning heat of the day, in ponds and rivers, where, immersed to the neck, they enjoy the refreshing coolness, or, wallowing in the soft mud of the morasses, acquire an additional protection against these, their most formidable, though tiny foes. Conscious of their own massive strength, they fear no other enemies:—

“Created thing nought valued [they], nor shunn’d;”

until the aggressions of man taught them his superiority: inoffensive and peaceful, they rarely use their gigantic powers of injury; but when irritated, they often exhibit a furious and revengeful ferocity. Heavy and massive in their structure, their pillar-like limbs seem ill calculated for speed; yet, “their pace, when they have fairly commenced it, from the length of

their stride, and the great propelling weight of their bodies, is for a time very rapid, and bears before it all ordinary obstacles, clearing a way through the thickest and most matted underwood.”\*

In many of the species, the canine or incisor teeth are developed into curved tusks, which in some attain a monstrous size. The nose also is greatly lengthened, sometimes into a broad flexible muzzle, and sometimes into a long snout or trunk. The Elephants are the best examples of both these peculiarities of structure. It is probable, that this Order contains the longest lived of all the land animals; Mr. Hodgson informs us, that the Indian Rhinoceros is believed to live for one hundred years; and that one, taken mature, was kept at Katmandoo for thirty-five years, without exhibiting any symptoms of approaching decline.† It is the common opinion in India that the Elephant lives three centuries; several now in the service of the East India Company were old when they came into possession of the Europeans, upwards of ninety years ago.

Most of the species, especially those of gigantic size, inhabit the continent and great islands of India, and Africa. Some, however, are peculiar to America, and others have a very extensive range, as the Hogs. No one can read the graphic and poetical description of Behemoth, in the Book of Job, without perceiving that it applies to some one of the great Pachyderms, whether the species be the existing Elephant, the Hippopotamus, or any of the older giants now extinct, the Mastodon, or the Mammoth.

\* Nat. Lib., Pachyd. p. 95.

† Proc. Zool. Soc. 1834, p. 98.

*Elephas,\* the Elephant.*

The most striking peculiarity in the form of this vast animal, is the elongation of the muzzle into a tubular flexible trunk, of most elaborate construction, endowed with exquisite sensibility, uniting the utmost delicacy of touch with great strength and power. At the extremity there is a little appendage serving the purpose of a finger, and giving "to the Elephant almost as much skill as the perfect state of his hand confers on the Monkey." The enormous solid tusks, and the size of the skull necessary to receive them, give a weight to the head, which could scarcely be supported by any muscles if the neck were long; it is therefore very short, and as the mouth cannot be brought to the ground, to graze, the trunk is given to compensate the deficiency. With this admirable organ, the animal collects grass and other food with great dexterity, and even pumps up water into its canal, which is then discharged into the mouth. The tusks occupy the place of the incisors in the upper jaw, proceeding downwards, and then curving upwards to a great length. They average about seventy pounds the pair, but a single tusk is said to have been sold at Amsterdam, weighing three hundred and fifty pounds. The feet have five toes, but they are enveloped in a callous leathery skin, and distinguishable, externally, only by the hoofs which enclose the tips of the toes. The number of these is one distinguishing mark of the two species, the African

\* Its Greek name.

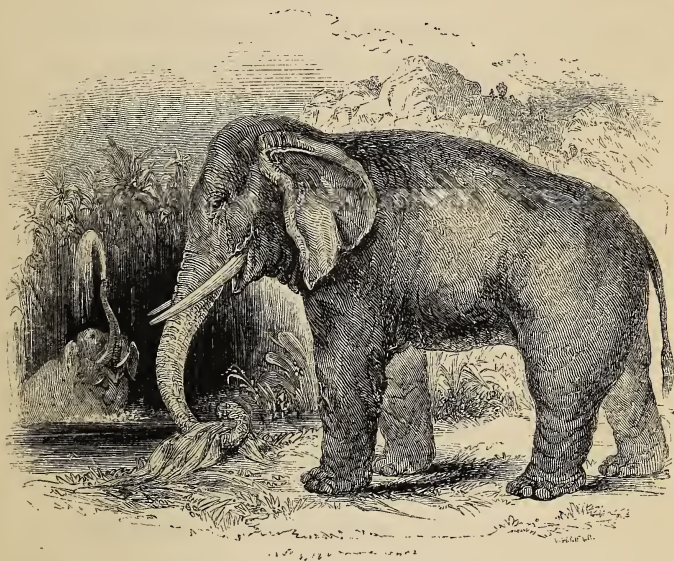
Elephant (*E. Africanus*) having but three on each hind foot, while the Indian (*E. Indicus*) has four. In a paper, however, communicated to the Zoological Society, "on the Mammalia of Nepâl," Mr. Hodgson suggests, that there are two varieties, or perhaps rather species, of the *Indian Elephant*, the Ceylonese, and that of the Saul Forest. The Ceylonese has a smaller lighter head, which is carried more elevated; it has also higher fore-quarters. The Elephant of the Saul Forest has sometimes five nails on its hinder feet.\*

The sagacity and intelligence of the Elephant appear to be of a very high order, scarcely, if at all, inferior to those of the Dog; and its docility is perhaps unequalled, considering that as it never breeds in captivity, every tame individual has been *personally* reclaimed from its savage freedom. Both species were trained to be the faithful and obedient servants of man in very early times, being extensively used in both the Indian and Carthaginian wars: in the East it is still the most useful and powerful beast of burden, but the subjugation of the African species appears to have ceased with the fall of "Rome's hated rival." The place which the former fills in the transport of army baggage, in the chase of the more fierce and powerful Cats, and in the barbaric pomp and magnificence of Eastern courts, is well-known. With its habits in the semi-freedom of Indian service, and in the unnatural captivity of our menageries, we are equally familiar; and no

\* Proc. Zool. Soc. 1834, p. 98.



book of Natural History omits to give amusing and interesting anecdotes of its sagacity and penetration, from the standard jest of the watered tailor of Delhi, downward. From the very triteness of the subject, we prefer to devote our very limited space to a few particulars of the less known, but not less interesting, African Elephant.



AFRICAN ELEPHANT (*Elephas Africanus*).

This animal, but recently separated as a species from its Indian relative, besides the number of the hoofs, is distinguished by the following among other differences. The forehead is convex, instead of being



hollowed; the head round instead of oblong, the lines of enamel on the surface of the grinders take lozenge forms instead of waved bands; the ears are very much larger, covering the whole shoulder; the tusks are also larger. It inhabits the thick forests of Africa, south of the Desert, in vast herds, seemingly undiminished by the annual slaughter made amongst them for the sake of their ivory. The hunting of the Elephant is a somewhat different affair from the coursing of a hare, requiring great coolness, courage, and presence of mind. Recent travellers in South Africa have drawn some animating pictures of the lordly animal in his wild dominions, and of the peril with which he is attacked. Mr. Steedman gives the following narrative: Galeyka, a Caffer chief, "having come unexpectedly in contact with one of these wild and formidable animals, he wounded it with his assagai; when the infuriated beast rushed quickly towards him, and Galeyka, with a daring peculiar to men in the habit of encountering these prodigious creatures, dashed suddenly as a last resource under its belly. By adopting this novel and bold expedient, and adroitly moving as the huge animal moved, he contrived to keep out of the reach of its proboscis, and to avoid being crushed by its ponderous tread. He continued to dodge about, as it were, in this manner, until the Elephant, after repeated but useless efforts to rid itself of the annoyance, became manifestly alarmed, and uttering a shrill cry, darted into the adjoining thicket, knocking down, however, the poor Galey-

ka, whose arm and several ribs were broken in the conflict. In this maimed condition, the chief succeeded in effecting his escape.”\*

The Elephant is pursued with much eagerness by the natives of South Africa, and the chase is usually a scene of great excitement and interest. Seeking him in the green valleys or umbrageous retreats in which he loves to dwell, they hesitate not to attack him on foot, armed only with their native spears or javelins, and a large knife. Taking advantage of his inability to see behind him, and his unwieldiness in turning, they often manage to creep up and hamstring him, before he is made aware of their approach: and then cast showers of javelins into him until he becomes mortally wounded, and falls, the signal for a general shout of triumph from the whole party. The Elephant is considered by them as a sacred or rather royal animal; and therefore the tip of the tail is presented to the chief of the tribe, to be suspended as an ensign of royalty, and the tips of the ears and proboscis are buried with much ceremony before the tusks are extracted, and the body left to be devoured by beasts. The enterprising traveller whom we have already quoted describes a rencontre which he himself witnessed: “Whilst we were engaged in exploring the neighbourhood for water, our attention was arrested by the sagacity of some elephants in a kloof, [cliff or pass,] just below us. Dismounting that we might approach them with greater caution, we perceived several issuing

\* Wanderings in S. Africa, vol. i. p. 19.

from the bush, and while Thackwray [a professed hunter] descended to obtain a shot at a large male with enormous tusks, perambulating in calm and dignified stateliness around the troop, I remained on an elevated spot, whence I could command a view of the animals feeding beneath. Among the herd were several young ones frisking,—if such a term may be applied to these clumsy animals,—with uncouth and awkward gambols, in all the natural freedom of their early vigour. One of them, rather larger than a calf, was standing between the fore legs of its dam, who was suckling it, and caressing it at the same time with her proboscis. As I continued to watch the scene, I saw Thackwray wave his hand for me to retire out of view, for he was now cautiously creeping forward under cover of the brushwood to get within shot; but the male Elephant caught sight of me before I could conceal myself from observation; when raising its trunk and flapping its large ears against its shoulders, it uttered a shrill cry, and dashed with the whole herd at its heels into the thickest part of the covert, where it was useless to follow. Mounting our horses again, we rode away, but had not advanced far before Thackwray discovered a pair of fine ivory tusks actively engaged in an adjoining part of the bush. This was too great a temptation to be withstood, and proceeding towards the spot, he ventured so close before he fired, that the cocking of his piece gave the first intimation of danger to the Elephant, which at the same instant received the fatal ball.

The poor beast ran for some distance before it fell: Thackwray marked it with his initials, meaning to return at some future time, as well as for those of another, which he had shot on the preceding day.”\*

“On another occasion, a herd of Elephants pursued Thackwray and his companion to the edge of a frightful precipice, the only chance of escape being to let themselves down on a projecting rock at some distance below the brink. Scarcely had they accomplished this, before an Elephant came up and attempted to reach them. In this situation Thackwray could easily have shot the animal from beneath, but was deterred by the apprehension, that its huge carcass might fall upon them, and thus cause their inevitable destruction.”† This young man at last fell a victim to his daring. Mr. Steedman informs us, he some time afterwards “lost his life in an encounter with Elephants similar [to the above], and almost on the very spot which had been the scene of our recent adventure. It appears that he was pursuing his usual occupation, accompanied by a Hottentot, when they fell in with a herd of Elephants and wounded one. On seeing it fall, the Hottentot supposed that it was dead, but on his approach, the animal rose and rushed furiously towards him; he threw himself instantly on the ground, and the enraged Elephant passed him by, tearing and scattering the trees in its progress: but darting into the covert where Thackwray stood in the act of reloading his gun, it knocked him down

\* Wanderings in South Africa, p. 67.

† Ib. p. 65.

and thrust one of its tusks through his thigh; then lifting him up with its trunk, dashed him about with the greatest violence, and trampling upon him, finished the work of destruction. When the mangled body was discovered, it presented the most appalling spectacle.”\*

Mr. Pringle gives us the following interesting particulars: “After mid-day, we came upon the recent traces of a troop of Elephants. Their huge footprints were everywhere visible; and in the swampy spots, on the banks of the river, it was evident that some of them had been luxuriously enjoying themselves, by rolling their unwieldy bulks in the ooze and mud. But it was in the groves and jungles that they had left the most striking proofs of their recent presence and peculiar habits. In many places, paths had been trodden through the midst of dense thorny forests, otherwise impenetrable. They appeared to have opened up these paths with great judgment, always taking the best and shortest cut to the next open savannah, or ford of the river: and in this way their labours were of the greatest use to us by pioneering our route through a most intricate country, never yet traversed by a wheel carriage, and great part of it, indeed, not easily accessible, even on horseback. In such places the great bull Elephant always marches in the van, bursting through the jungle, as a bullock would through a field of hops, treading down the brushwood, and breaking off with his proboscis the larger branches

\* Wanderings in South Africa, p. 74.

that obstruct the passage, whilst the females and younger part of the herd follow in his wake.

“Among the mimosa trees sprinkled over the meadows, or lower bottoms, the traces of their operations were not less apparent. Immense numbers of these trees had been torn out of the ground, and placed in an inverted position, in order to enable the animals to browse at their ease on the juicy roots, which form a favourite part of their food. I observed, that in numerous instances, when the trees were of considerable size, the Elephant had employed one of his tusks, exactly as we would use a crowbar, thrusting it under the roots to loosen their hold of the earth, before he attempted to tear them up with his proboscis. Many of the larger mimosas had resisted all their efforts; and indeed, it is only after heavy rains, when the soil is soft and loose, that they can successfully attempt this operation.

“While we were admiring these and other indications of the Elephant’s strength and sagacity, we suddenly found ourselves, on issuing from a woody defile, in the midst of a numerous herd of these animals. None of them, however, were very close to us; but they were seen scattered in groups over the bottom and sides of a valley two or three miles in length; some browsing on the succulent Spekboom, which clothed the skirts of the hills on either side; others at work among the young mimosas and evergreens sprinkled over the meadows. As we proceeded cautiously onward, some of these groups came more distinctly into view,—consisting appa-



rently, in many instances, of separate families, the male, the female, and the young of different sizes ; and the gigantic magnitude of the chief leaders became more and more striking. The calm and stately tranquillity of their deportment, too, was remarkable. Though we were a band of about a dozen horsemen, including our Hottentot attendants, they seemed either not to observe, or altogether to disregard, our march down the valley.

“As we rode leisurely along, through a meadow thickly studded over with clumps of tall evergreens, I observed something moving over the top of a bush close ahead of us, and had just time to say to the gentleman next me, ‘Look out there!’ when we turned the corner of the bush, and beheld an enormous male Elephant standing right in the path, within less than a hundred paces’ distance. We halted, and surveyed him for a few minutes in silent admiration and astonishment. He was, indeed, a mighty and magnificent creature. The two engineer officers, who were familiar with the appearance of the Elephant in his wild state, agreed that the animal before us was, at least, *fourteen feet* in height, and our Hottentots, in their broken Dutch, whispered that he was ‘een groot gruwzaam karl,—bania’, bania’ groot!’—or, as one of them translated it, ‘a hugeous, terrible fellow,—plenty, plenty big!’

“The Elephant, at first, did not seem to notice us, for the vision of the animal is not very acute, and, the wind being pretty brisk, and we to the leeward of him, his scent and hearing, though keen, had not

apprised him of our approach. But when we turned off at a gallop, making a circuit through the bushes to avoid collision with him, he was startled by the sound of our horses' feet, and turned towards us with a very menacing attitude, erecting his enormous ears, and elevating his trunk in the air, as if about to rush upon us. Had he done so, some of us would probably have been destroyed, for the Elephant can run down a well-mounted horseman in a short chase; and, besides, there was another ugly defile but a little way before us, where the only passage was a difficult pass through the jungle, with a precipice on one side, and a wooded mountain on the other. However, the 'gruwzaam karl,' fortunately, did not think proper to give chase, but remained on the same spot, looking steadfastly after us, well pleased, no doubt, to be rid of our company, and satisfied to see his family all safe around him. The latter consisted of two or three females, and as many young ones, that had hastily crowded up behind him from the river margin, as if to claim his protection, when the rushing sound of our cavalcade startled their quiet valley."\*

Captain Harris thinks that the African Elephant could be as easily subjugated as the Indian species, the only reason that it has never been attempted being a prejudice of the colonists against the probability of success. If brought under man's dominion, it would be a valuable ally in the destruction of those formidable wild beasts that infest Africa, even more than India. That the young are easily captured appears

\* African Sketches.

from the following interesting notes. On revisiting the scene of a successful elephant hunt the next day, Captain Harris says,—“Not an Elephant was to be seen on the ground that was yesterday teeming with them; but on reaching the glen which had been the scene of our exploits, a calf, about three and a half feet high, walked forth from a bush, and saluted us with its mournful piping notes. We had observed the unhappy little wretch hovering about its mother after she fell, and, having probably been unable to overtake the herd, it had passed a dreary night in the wood. Entwining its little proboscis about our legs, the sagacious creature, after demonstrating its delight in our arrival by a thousand ungainly antics, accompanied the party to the body of its dam, which, swollen to an enormous size, was surrounded by an inquest of vultures. The conduct of the quaint little calf now became quite affecting, and elicited the sympathy of every one. It ran round its mother's corse with touching demonstrations of grief, piping sorrowfully, and vainly attempting to raise her with its tiny trunk.” At length, “the miniature Elephant, finding that its mother heeded not its caresses, voluntarily followed our party to the waggons, where it was received with shouts of welcome from the people, and a band of all sorts of melody from the cattle. It died, however, in spite of every care, in the course of a few days, as did two others, much older, that we subsequently captured.”\*

Nearly forty years ago, the body of an extinct

\* Wild Sports of South Africa, p. 208.

Elephant was discovered, in a mass of frozen earth, at the mouth of the river Lena, in Siberia, on the shores of the Frozen Ocean. It was in a wonderful state of preservation ; the flesh was eatable by bears, wolves, and dogs ; the skin was present, clothed with reddish wool and black hairs, and there was a long mane on the neck. It was as large as the existing kinds, being nine feet four inches high, and the tusks measured nine feet six inches along the curve. For how many ages it had lain thus buried, it is impossible to conjecture ; that Siberia was its native region, is evident from the multitudes of fossil skeletons which abound in it, some of whose tusks are fifteen feet in length ; and that it was at that time a cold country, appears from its woolly covering. It is commonly known as the Mammoth, (*Elephas Primi-genius*.)

Another genus of trunk-bearing *Pachyderms*, but which is not known to exist in a living state, is found in great abundance in North America. It is the Mastodon\* of the Ohio, the larger species of which (*M. Giganteum*) far exceeded the Elephant in size. The bones are in a very fresh state, compared with fossil bones generally : in one of the skeletons, in Virginia, was found a very interesting proof of the food of the animal ; a mass of little branches, grass, and leaves, in a half-bruised state, among which was a species of rose, *still common there*, was enclosed in a kind of sac, probably the stomach ; while there are records of the Indians having found, attached

\* *Μαστός*, *mastos*, a teat, and *ὀδούς*, *odous*, a tooth.

to a skull, “a long nose, under which was the mouth.” The Indians of North America are persuaded that the great Mastodon yet lives in the unexplored forests of that country; a circumstance, all things considered, by no means impossible.

*Hippopotamus,\* the River-horse.*

Nearly equalling the Elephant in size, if not in height, and far more unwieldy and ungainly, the Hippopotamus is the aquatic form of the *Pachyderms*, and evidently leads to the herbivorous *Cetacea*. The skin is entirely without hairs; the belly nearly touches the ground; the enormous head ends in a bluff, square muzzle; the nostrils, eyes, and ears, are almost in one plane, and may thus be all at once projected from the water, with the smallest possible exposure of the head. The incisor teeth, as well as the canines, take the form of tusks, and make the hardest and whitest ivory. The species live habitually immersed in the great rivers of Africa, feeding only on vegetable substances, but occasionally coming on shore. It was formerly common in the Nile, and is usually considered the Behemoth of Scripture. The Hippopotamus of the Cape (*H. Amphibius*), where it is called the Sea Cow (a name peculiarly inappropriate), is of a greyish tint, varying, however, as it is wet or dry. The hide, which exceeds the thickness of an inch, is dragged from the carcass like plank, to be cut into the strong and durable whips

\* “ἵππος, *hippos*, a horse, and ποταμός, *potamos*, a river.

of the colony called *sjamboks*. Though generally timid and inoffensive, it is said to be, when irritated, a formidable, though clumsy adversary. Its voice has been variously described. Sparrman calls it a sharp, piercing cry, between grunting and neighing; Tuckey, who saw it in the Congo, says it is more like the bellowing of a buffalo, than the neighing of a horse; while Burckhardt, in Nubia, calls it a harsh and heavy sound, like the creaking or groaning of a large wooden door. It appears to walk on the bottom as on land, like the Water Ouzel among birds. Le Vaillant says, — “the river contained many Hippopotami; on all sides, I could hear them bellow and blow. Anxious to observe them, I mounted on the top of an elevated rock, which projected into the river, when I saw one walking at the bottom of the water. I remarked that its colour, which when dry is greyish, and when only damp or moist appears bluish, seemed to be of a deep blue.”

Captain Harris gives some interesting particulars in his lively style. The animal abounds in the Limpopo, “dividing the empire with its amphibious neighbour the Crocodile. Throughout the night the unwieldy monsters might be heard, snorting and blowing during their aquatic gambols, and we not unfrequently detected them in the act of sallying from their reed-grown coverts, to graze by the serene light of the moon, never, however, venturing to any distance from the river, the stronghold to which they betake themselves on the smallest alarm. Occasion-



ally, during the day, they were to be seen basking on the shore amid ooze and mud; but shots were more constantly to be had at their uncouth heads when protruded from the water to draw breath; and if killed, the body rose to the surface. Vulnerable only behind the ear, which is placed on a prominence, so as to resemble the garret windows of a Dutch house, they require the perfection of rifle practice, and, after a few shots, become exceedingly shy, exhibiting the snout only, and as instantly withdrawing it. Of all the mammalia whose portraits, drawn from ill-stuffed specimens, have been foisted upon the world, the Behemoth has perhaps been the most ludicrously misrepresented. I sought in vain for that colossal head—for those cavern-like jaws, garnished with elephantine tusks—or those ponderous feet with which ‘the formidable and ferocious quadruped’ is wont ‘to trample down whole fields of corn in a single night.’ Defenceless and inoffensive, his shapeless carcass is but feebly supported upon short and disproportionate legs, and his belly almost trailing upon the ground, he may not inaptly be likened to an overgrown ‘prize pig.’ The colour is pinkish brown, clouded and freckled with a darker tint. Of many that we shot, the largest measured less than five feet at the shoulder; and the reality falling so lamentably short of the monstrous conception I had formed, the ‘River-horse,’ or ‘Sea-cow,’ was the first, and, indeed, the only South African quadruped in which I felt disappointed.”\*

\* Wild Sports of South Africa, p. 218.

The granular fat lying beneath the skin of this animal is much esteemed as a delicacy of high consideration.

*Sus,\* the Hog.*

From the Hippopotamus to the Hogs the transition is easy: the latter have four hoofs to each foot, but



WILD BOAR (*Sus Scrofa*).

the two middle ones are much larger, while the small external ones do not touch the ground, giving the foot much of the appearance which it takes in the Ruminants. The lower incisors in these, as in the former, slant forwards, and the canines project into curved and formidable tusks. The muzzle is prolonged into a snout, but not a proboscis; the

\* Its Greek and Latin name.

margin is dilated and highly sensitive. Its use is to turn up the earth in search of roots and insects, in which operation the animal seems guided by its exquisite sense of smell. They eat also nearly all vegetable matters, and even flesh is not rejected.

The Wild Boar and Sow (*S. Scrofa*), of Europe, is the original of our domestic breeds; and its wide extension, through Asia and Africa as well, may account for what now appear permanent varieties, such as the Chinese breed, and others. The Wild Hog is a fierce and dangerous animal, possessing great strength and impetus in an attack; his tusks also are powerful and effective weapons. Swine are considered dirty by nature, but the charge is only true in a state of narrow confinement, where their litter is not often changed: in a wild state, no animal's lair is cleaner or drier; in North America, the author has often seen the immense nests of dry leaves which the semi-wild Hogs have scrupulously and industriously accumulated, in order to sleep dry and warm. It is true they wallow, but this, as we have seen, is a provision of nature common to all the naked *Pachydermata*. The intelligence of the Hog seems to be of a far higher order than is usually attributed to it; and the value of its flesh as human food is well known.

To enter into details of the habits or history of so familiar an animal would be foreign to our plan; we shall, therefore, merely observe, that a species closely allied, but apparently distinct, is found in New Guinea (*S. Papuensis*), and another in the

Moluccas (*S. Baboroussa*), remarkable for the great length of its tusks, resembling four curved horns.

*Phacochoerus*,\* the Wart-hog.

A remarkably hideous genus, distinguished by this name, is found in North and South Africa. Resembling the Hog in essential points, the head is monstrously developed, and the four large tusks projecting frightfully from the sides of the face, the large warts with which its countenance is disfigured, and the sack-like lobes into which the muzzle seems plunged, render it really terrific to behold. The Bushmen say of the Cape species (*P. Æthiopicus*), "We had rather attack a lion in the plain, than an African Wild Boar; for this, though much smaller, comes rushing on a man as swift as an arrow, and, throwing him down, snaps his legs in two, and rips up his belly before he can get to strike at it, and kill it with his javelin."†

The Hogs are represented on the American continent by the genus

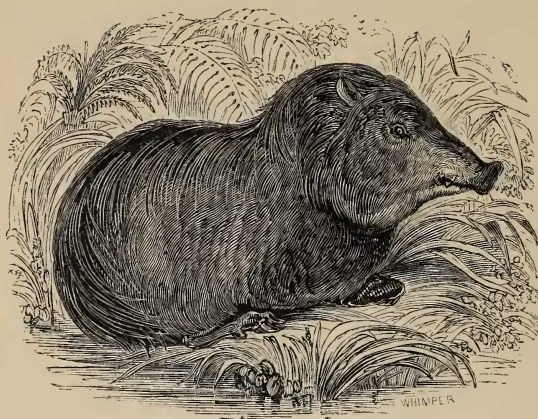
*Dicotyles*,‡ the Peccary.

The teeth differ in number, the tusks do not project from the mouth, the outmost hind toe is wanting, and the tail is flat and exceedingly short. But the most remarkable peculiarity is an orifice in the

\* Φακός, *phakos*, a wart, and χοῖρος, *choiros*, a pig.

† Sparrman's Voyage, vol. ii. p. 23.

‡ Δίς, *dis*, double, and κοτύλη, *kotyle*, an orifice, or navel.



WHITE-LIPPED PECCARY (*Dicotyles Labiatus*).

middle of the back, where a gland secretes an intolerably fetid liquid. In manners they resemble the Hog, but are fonder of the water, swimming with great ease and celerity. They are very easily domesticated.

*Rhinoceros*,\*—the *Rhinoceros*.

Here we again find tropical animals of vast size and massive strength, the companions and rivals of the Elephants. The feet have but three hoofs each, short and blunt; the bones of the nose, which are arched and very strong, support either one or two horns, attached merely to the skin, and apparently formed of hairs united into a solid mass. Where two exist, the one is immediately behind the other.

\* 'Piv, *rhin*, the nose, and *κέρας*, *keras*, a horn.

These huge creatures seem to possess the characteristics of their Order in the highest degree, especially that which confers its name; for the skin is enormously thick and hard, destitute of hair, and, in the one-horned division, arranged in deep doublings or folds around the neck, shoulders, and thighs. The two-horned species, especially those of Africa, are almost wholly free from these folds; these appear to manifest a malevolence and ferocity to which the Eastern kinds are strangers. The upper lip is elongated into a protrusive and prehensile muzzle, used to collect the branches and twigs of trees; but one species (*R. Simus*), which feeds only on grass, wants this protrusion, the muzzle being flat, like that of an ox. The horns are formidable weapons, not from their sharpness, but from the resistless impetus of the enraged animal: it is said that the animal has the power of moving one or both, and of making them clatter by striking each other; but this, though not impossible, seems to want confirmation. Six species are known,—*R. Indicus*, *R. Javanus*, and *R. Sumatranus*, belonging to Asia, the last being the connecting link with the African *R. Bicornis*, *R. Simus*, and *R. Keitloa*, which are all two-horned. More than a hundred years ago an Indian Rhinoceros was exhibited in London, of which an account was given by Dr. Parsons; several have since, at different times, reached Europe, all, we believe of the same species, and one is at present, (1842,) in the Gardens at the Regent's Park. It appears inert, but mild and inoffensive. Of the Javanese species



we have an interesting account from the pen of Dr. Horsfield, who saw a specimen in what we may term a state of domestication in its native island. He describes it as perfectly mild and gentle, allowing visitors even to mount it, and suffering itself to be driven back to its enclosure when it strayed. It fed on leaves and twigs of trees, and plantains, and other fruits. It was very fond of wallowing in the streams, and at last, after about six years' captivity, was accidentally drowned in a rivulet.\* The skin of this species is covered with small tubercles. The habits of the Sumatran Rhinoceros are almost unknown.

Of the two-horned kinds inhabiting the South of Africa, we have already noticed the peculiarity in the lip of *R. Simus*; the *Keitloa* is distinguished from *R. Bicornis* by the longer muzzle, and by the second horn being as tall as the front one, or taller. The colour of them all seems to be a light brown or drab, and their manners as far as known are nearly alike. The following quotations give us some idea of their violence, referring to *R. Bicornis*: "On our route we met a celebrated elephant hunter, a Hottentot of the name of Skipper, whose horse had lately been killed under him by a Rhinoceros. He stated, that before he had time to raise his gun to his shoulder, the animal rushed at him with great fury, thrust its horn into the horse's chest, throwing horse, Hottentot and all, over its back. The Rhinoceros went off without attempting to do him

\* Zool. Res. in Java.

any further injury, whilst he was in vain grappling for his gun to take a shot at the animal in his retreat. But," said he, "though he was too quick for me this time, I may meet him again some day, when I shall not forget to *betaal* him."\* Captain Harris says, "The country now literally presented the appearance of a menagerie; the hosts of Rhinoceroses in particular, that daily exhibited themselves, would almost exceed belief. Whilst the camp was being formed, an ugly head might be seen protruded from every bush, and the possession of the ground was often stoutly disputed. In the field, these animals lost no opportunity of rendering themselves obnoxious, frequently charging at my elbow when in the act of drawing the trigger at some other object, and pursuing our horses with indefatigable and ludicrous industry, carrying their noses close to the ground, moving with a mincing gait, which ill beseemed so ungainly and ponderous a quadruped, and uttering, the while, a sound between a grunt and a smothered whistle. In removing the horn with an axe, the brain was discovered, seated in a cavity below it, at the very extremity of the snout, a phenomenon which may in some measure account for its want of intellect and piggish obstinacy, as well as for that extraordinary acuteness of scent with which it is endowed. Irascible beyond all other quadrupeds, the African Rhinoceros appears subject even to unprovoked paroxysms of reckless fury; but the sphere of vision is so exceed-

\* Steedman's Wanderings in Africa, vol. i. p. 69.

ingly limited, that its attacks, although sudden and impetuous, are easily eluded; and a shot behind the shoulder, discharged from a distance of twenty or thirty yards, generally proves fatal. On our way from the waggons to a hill not half-a-mile distant, we counted no less than twenty-two of the white species of Rhinoceros, and were compelled in self-defence to slaughter four. On another occasion, I was besieged in a bush by three at once, and had no little difficulty in beating off the assailants." \* Burchell likewise speaks of the ease with which the animal is avoided by merely stepping out of the line of his headlong charge.†

There is reason to believe that another species exists in India, and at least two more in Africa; and the remains of nine fossil species are found, of which one was no larger than a Hog.

*Hyrax,‡ the Daman.*

Strangely contrasting with the animals we have just dismissed, we now consider some little creatures resembling in form and size some of the Cavies, with which they were formerly associated, clothed with thick fur, but in their anatomy displaying a very close affinity to the Rhinoceros. There are three species, the Syrian Daman (*H. Syriacus*), which is believed to be the Cony of Scripture, the Cape Daman (*H. Capensis*), the Rock Rabbit of

\* Wild Sports, p. 220.

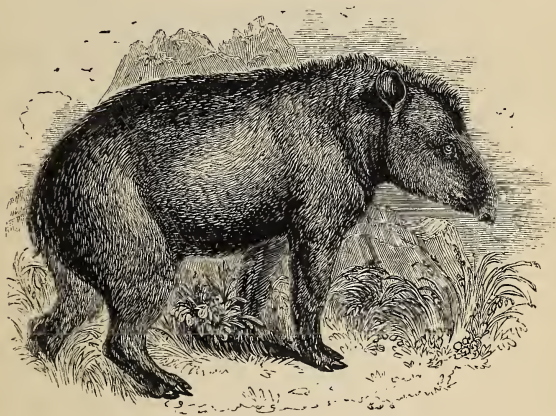
† Travels, vol. ii. p. 73.

‡ "Ґаҕ, *hyrax*, a kind of rat.

the colonists, and a climbing species (*H. Arboreus*), both of which last inhabit South Africa. Mr. Steedman says of the common Cape kind, "It is an extremely quick and active little animal, skipping along the shelving ledges of the overhanging cliffs, and darting with incredible swiftness into the holes and crevices of the rocks, by which it frequently eludes the grasp of its pursuers." \*

Passing over some extinct genera, exhibiting singular forms, we come to the genus

*Tapir, the Tapir.*



AMERICAN TAPIR (*T. Americanus*).

In which the nose is prolonged into a proboscis of some length, but destitute of the varied powers of the Elephant's versatile organ. They are stout

\* Wanderings, vol. i. p. 145.

round-built animals, as large as an Ass, covered with thin but stiff hair, somewhat resembling the Rhinoceros in their skeleton. They are fond of water, are vegetable feeders, mild, and docile, and capable of attachment to man, and might probably be made useful in servitude as beasts of burden or draught. Two or three species are found in South America, and one in India and the islands.

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The remaining genera of this order, which seem to possess little in common with the true *Pachyderms*, are termed *Solipedes*; having but one external toe, enclosed in a single large hoof. They contain animals highly serviceable to man, probably very early domesticated.

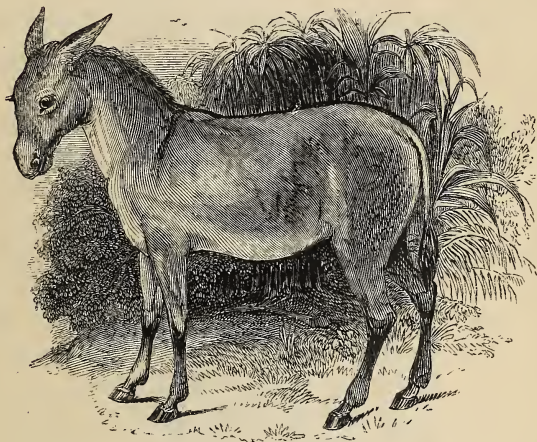
*Equus,\* the Horse.*

Of this genus but one species is known (*E. Caballus*), all our domestic breeds being varieties. A noble, docile, affectionate, and powerful creature, his assistance is invaluable, in the chase, in war, in travelling, in agriculture. The Horse does not exist in a wild original condition, for even those of Tartary are descended from reclaimed individuals; we know him only as our tried and valued friend. His fiery, but speaking eye, his arching neck, "clothed with thunder," his fine and glossy coat, his flowing tail, his graceful form, and his unrivalled swiftness,

\* Its Latin name.

strongly contrast with the heavy and inert animals with which he is associated; but in all these respects he has been doubtless improved by domestication. The fleetest and most beautiful races, are the Arabian, the Spanish, and the English; and in strength, probably our Dray Horses surpass all others. It is a singular fact, that our ancestors possessed the Horse previous to the invasion by Cæsar.

*Asinus,\* the Ass.*



WILD ASS (*Asinus Ferus*).

This humble but useful representative of the fiery Horse, has been lately made a distinct genus, including all the species except that one. The tail, furnished only with a terminal tuft of long hair, the

\* Its Latin name.



absence of callosities on the hind legs, the line down the back, and the tendency to a striped, and not a *spotted* colouring, are the distinctions of the Asses. The patient endurance of hunger and blows, the hardness of constitution, the sober temperance, which mark the common Ass (*A. Vulgaris*), together with the ease with which it is reared, render it peculiarly the servant of the poor. Much of its inferiority, its obstinacy, its proverbial stupidity, is due to its harsh servitude: the Asses of Spain and the East are far superior to ours in size and docility; and the Wild Ass, the undoubted original of our own, has the fleetness, the intelligence, and the indomitable love of liberty of the Wild Horse.

The Asses of Southern Africa are remarkable for the exceeding beauty and regularity with which their colours are distributed in transverse parallel stripes or bands, forming fine contrasts of hue. The Quagga (*A. Quaccha*), and the Dauw, or Mountain Zebra (*A. Montanus*), have dark-brown bands on a delicate bay ground; while the Zebra (*A. Zebra*) has the finer contrast of black upon a pure white, the stripes extending in beautiful waves over the head, face, ears, and legs. These are much more graceful in form than the common Ass, and the ears have not that unseemly size, which give that animal an air of so much stupidity. They are exceedingly wild, violent, and even fierce. The farmers of the Cape are frequently in the habit of driving a troop of Quaggas to the brink of a precipice, when those animals rush over the declivities, like the Bisons

in North America, and fall an easy prey to their pursuers. Mr. Pringle says, "A boor was pursuing a herd of Quaggas, and being close to some which were exhausted, attempted, to save shot, to drive one over a precipice; on which the desperate animal turned suddenly round, and, seizing him by the leg with his teeth, dragged him from his horse, and actually tore off his foot at the ankle. He died of mortification in a few days." The numerous herds of these beautiful animals, which, in company with the Antelopes, crowd the vast plains of Southern Africa, are described as contributing greatly to the life and charm of the landscape.



## ORDER VIII.—RUMINANTIA.\*

THIS is an exceedingly natural order, the individuals composing it showing little deviation from the common structure, except in one or two instances. The most prominent character is that of chewing the cud, or ruminating, an operation which has given name to the Order. The food being entirely vegetable, containing much woody matter with little nutriment, it is necessary that all which it can afford, be extracted: there are therefore four stomachs, which successively receive the food, three of which are so situated that the food may be sent from the gullet into either of them. The grass, hastily chewed, passes into the first and largest stomach, called the *paunch*; hence, after maceration, it passes into the second, or *honeycomb*; it is here pressed into little pellets, which one by one are forced up into the mouth to be slowly chewed over again. It would appear that this second chewing is a very pleasant operation, performed usually during repose. Being once more swallowed, it passes into the third division, called, from its numerous folds, the *manyplies*; and thence into the fourth, or stomach proper, where true digestion takes place. It is only by receiving large quantities of herbage, that the paunch becomes enlarged; in the sucking animal, it is very small, the milk passing at once to the fourth stomach.

\* *Rumen*, the paunch, also the cud.

The incisor teeth are wanting in the upper jaw, a hard pad receiving the pressure of the lower incisors. The canines are also generally absent; but some genera have them even projecting into tusks. The feet terminate in two hoofs, which face each other with a flat surface, as if a single round hoof had been cleft in two. Behind these there are occasionally two other toes, very small, however, and unused.

On many accounts this Order is the most subservient to man's wants. All the species afford in their flesh a most wholesome and agreeable food; their milk is abundant and palatable; their hides, horns, tallow, wool, &c., are largely used in manufactures, and many are strong and patient beasts of burden and draught.

Their disposition is peaceable and mild, which is correctly indicated by the gentle meekness of the countenance; in some species the sweet expression of the face, and the large soft melting eye, are peculiarly lovely and engaging.

Some of the genera possess permanent horns; in others they are shed and renewed annually; while in others they are entirely wanting. It is remarkable that in these last the canine teeth are found. The horns are often absent in the females when present in the males.

*Camelus,\* the Camel.*

Departing most from the general formation, the Camels shew some of the lingering characters of the last Order. They have no horns, but have canine teeth; the toes, united beneath by a spongy pad, are free above, their extremities being enclosed in small round hoofs, as in the *Pachyderms*. They possess slight claims to personal beauty or elegance, but in usefulness they yield to none. Adapted, by the structure of their feet, for traversing immense deserts of sand, the formation of the stomach enables them to endure long abstinence from both water and food.

The Camels are distinguished by possessing large bunches of granular fat on the back, which give them a deformed appearance; these appear to be reservoirs of nourishment, capable of being absorbed into the system during long seasons of fasting. The two species, the Bactrian and the Arabian, (*C. Bactrianus* and *C. Dromedarius*,) are distinguished, among other characters, by the former having two of these humps, the latter one. The former is less common, being chiefly confined to Central Asia; the latter spreads over Southern Asia and North Africa, where it is invaluable to the Mohammedan nations, as it affords the only means of traversing the vast and trackless deserts. The term *Dromedary* properly signi-

\* Its Greek and Latin name.

fies a swift, riding camel, a distinction of breed, not of species.

Allied to the true Camels, and representing them in the tropical regions of America, is the genus

*Auchenia*,\* the *Lama*.

These resemble the former in most respects, but are of smaller size, and a more graceful figure, and are unfurnished with humps. The toes are entirely separate, but terminated by crooked hoofs. They answer the same purpose of carrying burdens, as the Camels. There are two or three species.

*Moschus*,† the *Musk*.

A group of very elegant and very little Ruminants inhabit the Continent and Islands of India, differing from the Deer and Antelopes in the absence of horns, and in the presence of a long canine in the upper jaw, projecting downward as a tusk. There are three or four species, from one of which (*M. Moschiferus*) the well-known perfume called musk is secreted in a little bag beneath the belly. It inhabits Thibet and Tartary. Another (*M. Javanicus*), the Napu, a most beautiful little fairy creature, is not larger than a hare.

\* Ἀὐχὴν, *auchen*, a neck.

† Μόσχος, *moschos*, musk.



*Cervus*,\* the Deer.

We now come to those Ruminants which exhibit in most perfection the structure and habits of the Order, of which the possession of horns is one instance. In the genus before us, these are bony excrescences, formed in the spring with great rapidity, shooting out into branched antlers, as in the Stags, or into broad palmated disks, and falling off in the winter, to be again renewed. These are generally the peculiar ornaments of the male, but in the Reindeer of the Arctic Regions (*C. Tarandus*) the female is also furnished with them. It has been thought that one end of this periodical growth, is the employment of the superfluous blood produced by the sudden abundance of food after the interval of winter; those of the extreme northern species being much more heavy and branched than in those of more temperate regions, the branching being at the lowest in the Deer of India. In still warmer regions, the Deer almost cease to be found, their place being supplied by the Antelopes, &c., with permanent horns.†

The Deer are generally elegant and slender animals, light and graceful in their movements, which are performed with great speed and agility. Those which inhabit the colder climates, are however, more robust in form, and larger in size. The Elk or

\* Its Latin name

† See Cox, in Proc. Zool., Soc. 1833, p. 87.

Moose (*C. Alces*), of Northern Europe and America, is an animal of great size and strength, being as tall as a horse. It is of a clumsy figure, with a



ELK (*Cervus Alces*).

thick body, short neck, ass-like head, and awkwardly high legs. It is an animal of peculiar sagacity, and cautious watchfulness; and the hunter has need of all his skill and experience to outwit his game, and sometimes to escape the violence of its indignation.

The Reindeer (*C. Tarandus*) is the only species that has been trained to the service of man: its value to the inhabitants of Northern Europe is inestimable. This also is a species of great strength and robustness.

The Fallow Deer (*C. Dama*), so common in our

parks, differs in having the horns round at the base, and palmated at the tips. The white spots upon the pale variety make it a beautiful animal: the dark kind was introduced by James I. from Norway, to render the breed more hardy. That gigantic fossil animal, usually called the Irish Elk (*C. Giganteus*), was not an Elk, but a true Deer. Its height at the shoulder was six feet, and to the top of the horn more than nine feet and a half.

The Stags, of which our Red Deer (*C. Elaphus*) and the Wapiti (*C. Canadensis*) of North America



WAPITI (*Cervus Canadensis*).

are examples, are stoutly made animals, with horns round, branched with antlers.

Through the Asiatic Stags, in which the horns become less and less considerable, including the beautiful white-spotted Axis (*C. Axis*), we are led to the

Roe (*C. Capreolus*), with but two tines to its antlers; whose conjugal attachment and constancy is said to be equal to that of the famed Turtledove. It is still numerous in Scotland. Some Roes in South America (*C. Rufus*, &c.) have the horns quite simple, and destitute of any branches whatever. Finally, leading from the Deer to the next genus, we have



THE MUNTJAK (*Cervus Muntjak*) and the ROE (*C. Capreolus*).

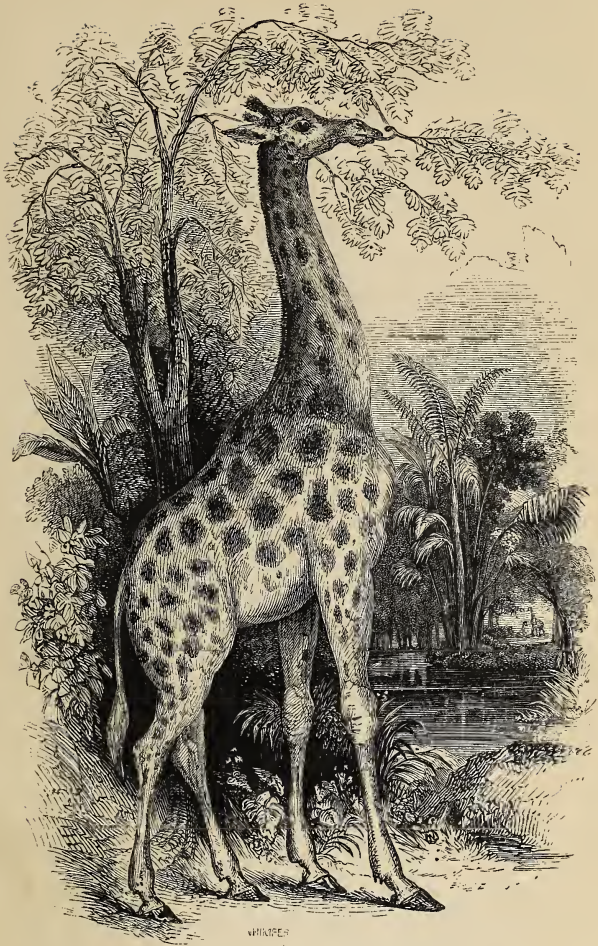
the Muntjaks of India (*C. Muntjak*), with horns elevated upon a hairy pedestal, and long and tusky canines, with which they make a vigorous defence against dogs when hunted. They much resemble our Roe, but are rather larger.

*Camelopardalis,\* the Giraffe.*

We have just seen Deer which have their small horns elevated on a lengthened pedestal, which is permanent: we next find a genus which has the pedestal alone, bony, permanent, and clothed with a hairy skin. There is also a sort of knob in the centre of the forehead. These, like the horns of the Deer, are joined to the skull by a *suture*, though they are never shed in either of the sexes. The animals are exclusively African, and most zoologists now are of opinion that there are two species, that from the North, the Nubian Giraffe (*C. Antiquorum*), the species so often introduced into the Roman Amphitheatre, and that from the Cape (*C. Giraffa*). The differences, however, are not external. The specimens at present existing and breeding in the Zoological Gardens are of the former species. From the great length of the neck, and the height of the fore-shoulder, the animal is of very singular, but graceful form, and its face, corresponding with its disposition, has all the meek and gentle expression of its Order. The ground colour is pale drab, profusely marked with large irregular angular spots of dark fawn, which answer in shape to each other, leaving narrow interstices of the light ground. This *design of colouring* is also found in some of the Antelopes. The height is from eighteen to twenty-two feet, strongly contrasting with the little Musks and *Blauw-bok*. The food of the animal is the

\* Κάμηλος, *camelos*, a camel, and πάρδαλις, *pardalis*, a panther.





NUBIAN GIRAFFE (*Camelopardalis Antiquorum*).



foliage of the elegant Mimosa, which its long neck enables it to reach with ease. Its pace is peculiar; the two right feet being advanced together, then the two left; the acquired amble of a lady's horse. With this motion it gets over the ground at a rapid rate, from its length of limb. The Lion alone is able to prey on it: it is reported that he springs on the back of the Giraffe, where, fixing himself by his terrific claws, in spite of the exertions of the quarry, he gnaws the living flesh, till the poor animal drops from loss of blood. The Giraffe will sometimes carry its inexorable rider for many miles, before its giant strength is exhausted. The Lion, however, sometimes fails to secure his hold, and is often driven off severely bruised by the powerful kicks of the Ruminant. And even when fixed, he is occasionally shaken off; for modern travellers have found specimens, bearing on the back and shoulders the deep scars of such a conflict. To guard against such attacks, a beautiful and beneficent provision is made, which we must not pass over. In most of the herbivorous animals, and particularly in the more feeble and timid, the eyes are so placed as to have a lateral direction, and are remarkably prominent. Having to maintain a constant watch against their foes, it is necessary that they should have a wide range of vision. The Hare, Deer, and Antelope, are examples, but especially the one before us. "One of the most striking circumstances connected with the eye of the Giraffe is its prominence; and so much so is this the case, that the *eye-ball* is perfectly

apparent to any one standing in a right line behind the animal, while the person occupying such a position is equally visible to the Giraffe. A native of the hills and plains of Africa, abounding in ferocious beasts of prey, among which the Lion is its most formidable enemy, the Giraffe takes in the horizon at a glance, almost without moving, and thus, enabled to discern an enemy at a considerable distance, he may browse at ease on the foliage of the Mimosa.”\* The tongue is long and narrow, and, the tip being first bent in the form of a hook, is used to reach down the twigs. We have seen a cow, browsing on a willow, bend and use her tongue in exactly the same manner. In a state of captivity they have the confidence and docility of cattle, with many of their manners.

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The Ruminants which have hollow horns, permanently sheathing a bony core, now demand our attention. They comprise numerous genera, and include the domestic cattle of mankind. The first genus, probably more closely connected with the one just noticed by some undiscovered animals in the centre of Africa, is the extensive one

*Antilope, the Antelope.*†

Most of this tribe possess the lightness and swiftness of the Deer, and some are even superior in these

\* Martin, Quad. p. 34.

† "Ἀνθόλοψ, from ἄνθος, *anthos*, a flower, and ὄψ, *ops*, the eye.

respects. With one exception, the Prongbuck of N. America (*A. Furcifer*), the horns do not form antlers, but are in general twisted spirally. Africa is the



CAANA (*Antilope Oreas*), SPRINGBOK (*A. Euchore*), and BLAUWBOK (*A. Pygmæa*).

great home of the Antelopes, whose southern plains are thronged with innumerable hosts, which, driven by drought into the cultivated districts, eat up "every green herb;" leaving the region a desert, as if an army of locusts had passed. The beautiful Spring-bok (*A. Euchore*), remarkable for the fold of skin upon the croup, which, opening as the animal

leaps, reveals a large patch of white, is especially numerous. In so large a genus there is of course much variety; while some are minute and timid, others are of giant size, strength, and courage. The Pigmy Antelope (*A. Pygmæa*), the smallest and most elegant of all the *Ruminantia*, rarely exceeds ten inches in height. Mr. Steedman says,—“I occasionally caught sight of the little Blauw-bok, or Pigmy Antelope, which inhabits the woods and lives among the thick bushes. Nothing can surpass the grace and agility with which these elegant little animals bound along through the shady avenues of the primeval forests of South Africa; and now skipping over some opposing shrub—now darting beneath the rank vegetation, butting at each other with their tiny horns, and playing a thousand innocent and amusing gambols.”\* On the other hand, the Eland or Caana (*A. Oreas*), and the Koba of Senegal (*A. Equina*), equal the largest horse in size and power. The Gems-bok (*A. Oryx*), a violent and fierce beast, defends itself against the Lion with such success that both are occasionally found dead, the Lion transfixed by the straight horns of the Antelope. Mr. Steedman tells of a boor, who was attacked by a wounded Gems-bok; the animal rushing to him, thrust its horns into his horse, throwing off the rider with great violence.†

But while the majority of these animals have the slender form and taper limbs of the Deer, other genera seem to have their representatives also among

\* Wanderings, vol. i. p. 321.

† Ibid. vol. ii. p. 1.

them. The heavy form, thick head, square muzzle, and long tufted tail, of the species called the Barbary Cow (*A. Bubalis*), mark its approach to the Ox; the American woolly species with very small horns (*A. Lanigera*), resembles the Sheep; while in the simply-curved knotted horns, the long pendent beard,



WOOLLY ANTELOPE (*A. Lanigera*).

and even the grey colour, of *A. Barbata*, we perceive a close approximation to the Goat. But in one or two species, there is such a combination of the characters of different families, as has induced some authors to separate them by the name of *Catoblepas*, the Gnu.



*Catoblepas,\* the Gnu.*

It is true Mr. Burchell is inclined to deny that there is anything extraordinary in the form of this animal; "it is an Antelope, and that is all."

GNU (*Catoblepas Gnu*).

But the contrary opinion, not of compilers, but of those who, like himself, have seen the creature in its native plains, has been too often expressed to be lightly set aside. Mr. Pringle considers it the link between the Buffalo and the Antelope, while others

\* Κατὰ, *kata*, downward, and βλέπω, *blepo*, to look.



see in it as much of the Horse as of either. “The horns approximated and enlarged at the base, like those of the Cape Buffalo (*Bos Caffer*), descend and turn up at the point; the muzzle is large, flat, and surrounded with a circle of projecting hair; under the throat and dewlap is another black mane.”\* Thus far the Ox. “It has the body and croup of a small Horse, covered with brown hair; the tail furnished with long white hairs, like that of the Horse, and on the neck a beautiful straight mane, the hairs of which are white at the base, and black at the tip.”\* Mr. Steedman having shot a Gnu (*C. Gnu*) that had fallen into a chasm, takes occasion to say,—“The Gnu is about the size of a full grown Ass. The neck and tail precisely resemble those of a small Horse, and its pace, which is a species of light gallop, is so perfectly similar, that a herd of Gnus, when seen at a distance scampering over the plains of South Africa, might be readily mistaken for a troop of Zebras or Quaggas, which inhabit the same localities, if their dark and uniform colour did not distinguish them. They live in numerous herds, are naturally wild and difficult of approach, and when wounded, will turn upon the hunter and pursue him, dropping upon their knees before making an attack, and then darting forward with amazing force and celerity. When first alarmed they fling up their heels, and caper like a restive horse, tossing their heads and tails, and butting at the mole hills, or any other object that may happen to be in the

\* Cuvier.

way: but immediately after, off they start, traversing the desert with a speed which soon carries them beyond the reach of danger. They do not run in a confused crowd, like sheep or oxen, but in single file, following a leader, and exhibiting the most agreeable regularity, as they bound over the level plains."\*

We must not dismiss the Antelopes, before noticing the soft beauty of their large black eyes, which has furnished the eastern poets, and our own too, with so many delightful comparisons; and which has probably originated the name of the tribe.

*Capra,† the Goat, and Ovis,† the Sheep.*

Of these two interesting genera, associated with man in his earliest historical records,‡ accompanying the Patriarchs in their self-denying wanderings, the subjects of the most acceptable sacrifice, and (the latter) a type and emblem of Him who bore the sins of a guilty world, as "THE LAMB THAT WAS SLAIN,"—we have not room to say much. Our domestic races (*C. Hircus*, and *O. Aries*,) are well known and easily distinguished, but it is difficult to find any permanent characters of sufficient importance to furnish generic distinctions, the primal parentage of each being lost in obscurity. We subjoin the points of difference between the Wild Goat and Sheep of Nepâl, given by Mr. Hodgson, in a paper published in the Proceedings of the Zool. Society.§

\* Wanderings, vol. i. p. 139.

‡ Gen. iv. 2.

† Their Latin names.

§ 1834, p. 108.

## "GOAT.

## SHEEP.

"Whole structure stronger and more compact.	Less so.
Limbs thicker and more rigid.	Feebler and more slender.
Hoofs higher and more compact.	Lower and less so.
False hoofs well developed.	Evanescent.
Head smaller and finer.	Larger and heavier.
Facial line straight.	Chaffron arched.
Ears shorter and rounded.	Longer and pointed.
Tail short, flat, and naked below.	Longer, less depressed, and half naked only.
Withers higher than croup.	Croup higher.
Fore legs stronger than hind.	Fore and hind equal.
Croup sloped off.	Not so.
Odorous.	Not so.
Nose moister, and nostrils short and wide.	Less moist, longer, and narrower.
Horns of middling size, keeled, and turned upwards.	Horns very large, not keeled, and turned to the sides.
Eye darker and keener.	Paler and duller.
Hair long and unequal.	Short and equal.
Back arched.	Back straight.
Bears change of climate well.	Bears it ill.
Is eminently curious, capricious, and confident.	Is incurious, staid, and timid.
Barks trees with its horns, feeding on the peel, and on aromatic herbs.	Does not bark trees, and is less addicted to aromatics.
In fighting, rears itself on its hind legs, and lets the weight of its body fall on the adversary."	In fighting, runs atilt, adding the force of impulse, to that of weight."

We may add, that the Ibex of the Alps (*C. Ibex*), and the Mouflon of Sardinia (*O. Musimon*), have been supposed to be, respectively, the origin of our common kinds ; while other naturalists refer them to the Wild Goat of the Caucasus, (*C. Ægagrus*), and

the Argali of Siberia. (*O. Ammon.*) They differ little from each other in manners, food, strength, and intelligence, in a state of freedom; but while the Goat retains much of his native character and self-reliance, the Sheep has become timid, helpless, weak, and stupid, by subjugation; and utterly dependent on man. It is a very singular fact, and one calculated to originate interesting reflections, that among the multitudinous and varied fossil remains of extinct animals, the denizens of a former world, that lie scattered so thickly in the crust of the earth, no remains of either the Goat or Sheep have as yet been detected.

Besides the use which is made of the flesh of both animals, which, though extensively eaten in all parts of the world, has a tendency to a rank and disagreeable flavour; both the Sheep and the Goat, the former more particularly, furnish material for a large portion of the clothing of civilized nations. The curious property of *felting*, which distinguishes wool from hair, depends upon the fact, that every fibre is covered with microscopically-minute scales overlapping each other, like the young leaves on the root of a lily. These entangling in each other in certain directions only, the fibres by being moved to and fro, adhere more and more closely, at length assuming that solid appearance seen in the substance called *felt*, and giving much of its compact character to woven cloth.

The wool of the Spanish Sheep, called the Merino breed, now naturalized in Saxony, and in our own

Australian colonies, is perhaps superior to all others for fineness ; but in other respects some of our English breeds have the pre-eminence. The exceedingly fine silky hair of the Angora, Cashmere, and Thibet Goats is woven into shawls of exquisite beauty and great value.

*Bos,\* the Ox.*

The last genus of the Ruminantia, and the one with which we close our notices of Terrestrial Mammalia, is without doubt the one to which, in a domesticated condition, the “lord of the creation” is most extensively indebted. “If the qualities of the Dog are of a higher and more intellectual character, and bring it into closer communication with man as a social being ; and if the Horse, as a beast of burden and of draught, serves more to his immediate personal assistance ; the Ox surpasses these and all others in the devotion of its powers while living, and the appropriation of every part of the body when dead, to the wants, the comforts, and the luxuries of its owner.”† It is a small but very natural genus, consisting of about eight known species, all of which resemble each other in essential points, and manifest little approximation to other genera. Four of the species have been, in different countries, subdued to the service of man, and their great strength made available for the purposes of husbandry, and in some instances, of riding and draught. They are mostly large, thick-set animals, with stout limbs, a broad muzzle, and a pendulous dewlap : the horns, found

\* *Bovis*, *bous*, an ox.

† Bell, Brit. Quad., p. 412.

in each sex, are round, pointed, and curved, supported on a bony centre, which is very porous. Their flesh is the most nutritious, the most digestible, and the most agreeable, of all animal food; and is most extensively consumed.

The races are pretty equably distributed as to geographical range: besides the common Ox, which has been carried by man whithersoever he has migrated, and which seems originally to have been European or Asiatic; one is certainly a native of Europe, three of Asia, one of South Africa, and two of North America. South America has no native representative of the genus.

Of these species, the common Ox (*B. Taurus*) is undoubtedly the most important. Like most of our domestic quadrupeds, its original stock is a matter of doubt and dispute: perhaps the fact may be, as we have already hinted in speaking of another animal, that it was originally given to man as the servile lightener of his penal toil; or at least, that it was subdued at a period so early, that even the *pristine terrigenes* themselves, with their offspring, were made to bow their noble necks to the yoke. And now even in those countries where other races are domesticated, the *Taurus*, in some or other of its numerous varieties, flourishes; bearing the vertical sun of India, as well as the long and cheerless winter of Sweden. In our own country it is well known how many of our necessities and comforts are dependent on its labours, its flesh, its milk, its hide, its horns, its hoofs, its bones, its blood. It is in Devonshire that the docility and strength of this



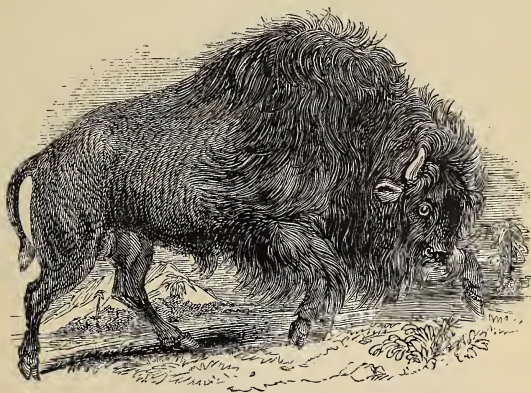
patient creature may be best seen. Bred to a very high degree of perfection, the Ox here manifests extraordinary good temper, and willingness to labour, with a strength, agility, and perseverance truly admirable. "Four good Devonshire Oxen will do as much work as three horses; and in returning with empty waggons in harvest, they will trot six miles an hour." Many other breeds have equal excellence in other points, according as the desired object be labour, fattened meat, or the milk of the female. The Cow of the hornless Suffolk breed, will often yield thirty-two quarts of milk per day.

There is, in some parks on both sides of the Scottish border, a remnant of a noble breed, supposed to be the ancient wild cattle of the British forests. They are of a pure creamy-white, with red ears, and a black muzzle; and have all the savage wildness of an unsubdued race. But probably the ancestors of these were individuals escaped from domestication, when our country afforded them abundant shelter and concealment.

In India several breeds are cultivated of peculiarly gentle disposition, but varying greatly in size from that of a small Sheep to that of our largest Oxen; they are marked by a singular excrescence on the shoulders, resembling the hump of the Camel, and like it composed of gristly fat. This variety is usually named the Zebu.

The Aurochs, (*B. Urus*), a savage and ferocious animal of great power, is found in the great marshy forests of Poland and Southern Russia. It has been by some considered the stock of our breeds, but

Cuvier denies their identity. It is the largest quadruped of Europe. The broad hairy forehead, the long and spreading horns, and the thick and bushy mane and beard, give a formidable and lion-like aspect to this animal. In these particulars it is equalled by the Bison of North America, (*B. Bison*),



THE BISON (*Bos Bison*).

the largest quadruped of that continent, whose countless herds formerly reached from the Atlantic to the Pacific, but which is now almost confined to the vast plains west of the Rocky Mountains. The other American species is the Musk Ox, (*B. Moschatus*), inhabiting the dreary shores of the Polar Sea, which approaches the Sheep in some of its characters. Its appearance is remarkable, from its hair, which is very thick and woolly, reaching to the ground. The musky odour common to all the race, is in this species peculiarly strong.

The Yak, or Grunting Ox, (*B. Grunniens*), is a

small species, domesticated in Thibet. It resembles the last in the length of its hair: but it has a long mane on the back, and a tail free and flowing, like that of the Horse. The Buffalo of India (*B. Bubalus*) is distinguished by its horns, which project sidewise, and by its rounded forehead. It is a powerful and somewhat vicious animal, but is used in the East for drawing carriages. The Jengell Ox, (*B. Frontalis*,) used in the northern districts of India, resembles the common Ox in some of its characters. Finally, the Cape Buffalo, (*Bos Caffer*,) an animal of great size, and most ferocious disposition, inhabits the woods, to the north of the Cape of Good Hope, completing the series.



THE CAPE BUFFALO (*Bos Caffer*).



TROOP OF DOLPHINS (*Delphinus Delphis*); COW-WHALE (*Manatus Dugong*) in the distance.

ORDER IX.—CETACEA.\*

LEAVING entirely the solid earth, we have now to examine animals whose whole life is passed in the sea, never (or very rarely) coming on shore; a mode of life for which their form and their whole anatomical structure is admirably adapted. Their external appearance is that of a fish, from which circumstance, joined with their aquatic habits, the vulgar in all ages, and sometimes even the votaries of science, have classed them with those inferior animals. They are, however, notwithstanding their un-

\* Κῆτος, *ketos*, a whale.

usual form, strictly Mammalia: their blood is hot, their respiration aërial, their ears open outwardly, their young are produced alive, and suckled after birth with true milk.

The limbs are greatly modified; the fore pair are shortened and altered into broad fins, covered with continuous skin, and shewing no division of toes, nor, with one single exception, any claws: the bones of the hand, however, are very distinctly recognized in the skeleton. In some species, there are a few minute bones imbedded in the flesh, unconnected with the spine, which represent the *pelvis*, but in general, the hind limbs are altogether wanting. The tail is dilated into a broad, flat, double fin, possessed of enormous muscular power, which being placed horizontally, strikes the water upwards and downwards, and not sidewise as in Fishes. The object of this position and movement is to enable the animal to mount to the surface of the water from great depths, when breathing becomes necessary.

The vast pressure of so great a volume of water as that to which the Cetacea are often exposed, amounting sometimes to a ton upon each square inch, would crush an ordinary animal instantly to death; but this result is obviated by a most admirable contrivance. The blubber, which, as is well-known, invests the body of the Whales to a great thickness, is not, as supposed, *beneath* the skin, but actually *in it*. The true skin is found to be continued down to the muscles, of a very open texture, caused by the loose interlacing of numerous fibres,



in which is contained the oil. If a hog be skinned, the fat is left lying upon the flesh, but it is impossible thus to tear off the skin of the Whale; if sufficient force be applied, the whole skin and oil will come up together. Mere fat would not have resisted the pressure, but this structure acts with the elasticity of so much India-rubber, (sometimes more than a foot thick,) possessing a density and resistance, which, the more it is pressed, resists the more.\* This thick coat of fat, a non-conductor of heat, acting as a blanket, serves to prevent the chilling influence of the Arctic Seas upon the blood, and keeps the animal heat uniform.

As the *Cetacea* must come to the surface to breathe, it was expedient that as small a surface should be exposed on such occasions as possible: hence the nostrils open at the very crown of the head, by an orifice called the blow-hole, through which is also ejected the water taken in with the food. The closing of this aperture when beneath the water, is effected by a very beautiful valvular apparatus, a stopper of great resisting power.

Many witnesses have borne testimony to the anxious affection which some of the larger species exercise towards their offspring: the mother "holding them beneath her fins, and protecting them with the greatest care and courage from every assailant."

Enjoying means of progression so extensive, living in a medium but little affected by variations of climate, the *Cetacea* are not generally bounded by

\* Nat. Lib. Mammalia, vol. vii. p. 48.



the strict geographical limits which confine the terrestrial Mammalia. It appears, however, that the species which frequent the Northern and Southern seas are distinct, and some, especially of the smaller kinds, seem very limited in their locality.

Before we come to the *Marine Cetacea*, we meet with a few species which are evidently intermediate between animals so different as these and the *Quadruped Mammalia*. They are usually known as the *Herbivorous Cetacea*. The order to which they bear the closest affinity is the *Pachydermata*. The great size of many species of that order, the naked skin, the small eye, the wide mouth, the short flattened tail, and even the tendency, as in the Hog, to form fat on the surface of the body, all mark the transition. But there is a fossil animal among the *Pachyderms*, named the *Deinotherium*,\* from whose lower jaw two tusks arose as in the Hippopotamus, but then curved downward to an enormous size. It is supposed to have been even still more aquatic than the last-named animal, and is considered the uniting link between it, and those of which we are about to speak.

*Manatus,† the Cow-whale.*

Having flat grinders, these animals feed on the aquatic plants that grow in abundance at the mouths of tropical rivers, and even, sometimes, crawl on shore to feed.‡ When seen in this situation, the broad

\* Δεινός, *deinos*, terrible, and θηρίον, *therion*, a wild beast.

† *Manus*, a hand.

‡ Cuvier.

round face, and the *mammæ* on the breast, may have originated some of the accounts received of mermaids, &c., though it is very doubtful whether all such reports can be thus explained away. The stomach is fourfold, as in the Ruminants. Vestiges of claws appear on the fins, whence they are called "handed." The body is terminated by a broad fin-tail as already described. The *M. Americanus* inhabits the African and American rivers, and the *M. Dugong* those of India. The latter has true tusks, though short, which are wanting in the other. Both are frequently called Sea-cows. They differ from the true *Cetacea* in the nostrils opening in the muzzle and not on the crown.

*Delphinus*,† the *Dolphin*.

The Dolphins and Porpoises have the jaws armed with very numerous teeth, conical and sharp-pointed. They are the most carnivorous, and in proportion to their size, the most cruel of their order. Voracious, and ravenous as they are, were they as large as the Whales, they would depopulate the deep. They are, however, comparatively small, though the Grampus (*Phocæna Orca*) sometimes attains the length of thirty feet. Dr. Grant has observed that several circumstances in the anatomy of the carnivorous *Cetacea* shew a resemblance to the Crocodiles in the *Reptilia*. We cannot in a work such as the present enter into these details, but we may mention the extension of the face, and its horizontal direction; the

\*  $\Delta\epsilon\lambda\phi\iota\nu$ , *delphin*, its Greek name.

similarity of form, and the alternate disposition of the teeth; the shortness and immobility of the neck; the coarse, fibrous, and spongy texture of the bones, and the thickness of the skull, together with the fixed condition of the bones of the face, affording, as in those formidable reptiles, a stronger resistance during their conflicts with living prey.\*

The fables which the ancients delighted to invent of the intelligence and docility of the Dolphin, and of its love for mankind, are of course unworthy of the serious consideration of the naturalist. Still there is much in its manners that is interesting. No one can have crossed the ocean, without having had the tedium of the voyage often relieved by the sportive gambols of the common Dolphin, (*D. Delphis*.) First seen near the horizon, the shoal pours down to the ship with the swiftness of the wind, leaping in their course several feet out of water, and when arrived, shooting round the object of their curiosity with incredible velocity, then herding immediately under her bows, they continue to romp and frolic there as if she were at anchor, often accompanying her for several miles.

The form of the Dolphins is rounded, tapering gracefully to the tail: the head large and round. The skin is without hair, exceedingly smooth and glossy, and the white belly of the common species is beautifully clear and pure. The true Dolphins are distinguished from the Porpoises (*Phocæna*†) by the

\* Proc. Zool. Soc. 1833, p. 65.

† Φώκαινα, *phokaina*, from φώκη, *phoke*, a seal.

presence in the former of a long narrow beak, almost like that of a bird. Seamen, however, universally apply the term Porpoise to both. Their general form and manners are the same; the common Porpoise (*Phocæna Communis*) is the smallest of the *Cetacea*, rarely exceeding four or five feet. The number of the teeth becomes in these animals a character of little value: the difference in individuals of the same species is often great: they are, however, in the Dolphins very numerous, some kinds having upwards of one hundred and fifty.

*Monodon,\* the Narwhal.*

This is a singular and interesting genus, consisting of but a single species (*M. Monoceros*).† It is highly remarkable for the enormous developement of its single tooth into a long straight horn-like tusk, projecting from the head in a line with the body, sometimes to the length of nine or ten feet. It is spirally twisted, tapering to a point; and is composed of the finest ivory. The animal has, strictly, two teeth, but only one is thus prolonged, the other remaining hidden within the jaw; and in the female both are thus concealed. Instances are not wanting, however, in which both teeth have been found nearly of equal length, and that occasionally even in the female. The animal is often called the Sea Unicorn, and all sorts of fabulous powers were formerly ascribed to its horn.

\* Μόνος, *monos*, single, and ὀδούς, *odous*, a tooth.

† Μόνος, *monos*, single, and κέρας, *keras*, a horn.

Though common in northern seas, it is not often pursued, the oil produced being small in quantity. It is rather a handsome creature, being white, marbled with irregular dark brown spots. Its length is from fifteen to twenty feet. It has no fin on the back.

*Physeter,\* the Sperm-whale.*

The Cachalots, or Sperm Whales, are remarkable for their enormous head, square and seemingly cut off in front: the upper jaw has no teeth apparent, but the lower, which is long and very narrow, is furnished with about fifty conical teeth, which fit into holes in the upper jaw when the mouth is closed. The immense and singularly formed head, is hollowed into large caverns, filled with a peculiar oil, which on cooling becomes hard, and when refined, forms the beautiful crystallized fat called *Spermaceti*. This substance is the chief object of desire in the pursuit of this strong and ferocious animal, for it produces no *whalebone*, and very little blubber. But there is another substance called *ambergris*, valued chiefly as a perfume, which is formed within the intestines of this Whale in a state of disease.

They have a fin on the back, which, while it has been compared in the High-finned Cachalot (*P. Tursio*) to the mast of a vessel, is in the common Sperm Whale (*P. Macrocephalus*)† only a callous protuberance.

From its size and strength, and from its furious

\* Φυσάω, *physao*, to blow.

† Μακρὸς, *makros*, long, and κεφαλή, *kephale*, the head.

violence when wounded, the chase of the Sperm-whale is a highly hazardous employment. "A single blow with his tail, will dash a boat to pieces, and scatter the unhappy navigators wide on the surface of the ocean; and there is a well authenticated instance on record of an American ship of large size being stove in and foundered by the blow inflicted by the head of a male Cachalot." It is pursued both in the Northern and Southern Seas, in which it associates in herds of one or two hundred, chiefly females, led by an old male. The cuttle-fish (*Sepia*) forms a large portion of their food.

*Balæna,\* the Whale.*

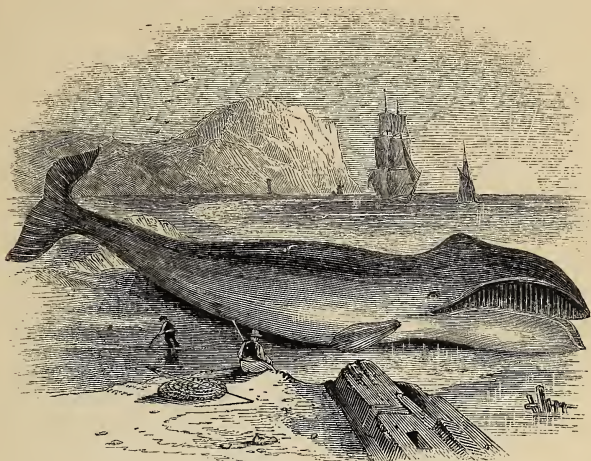
Attaining to as great a size as the Cachalots, and possessing as large a head, the true Whales are easily distinguished by the head being of a somewhat more symmetrical form,—more narrow and rounded in front, and by the total absence of teeth in either jaw. In the place of these instruments, the Whale is provided with a very singular apparatus; the upper jaw, which shuts into the lower, is furnished with a great number of parallel thin plates, placed perpendicularly and very closely set, composed of a fibrous horn, though usually called *whalebone*; they are in number about three hundred in each jaw, some of them twelve feet long, but diminishing in size; fringed at the edge. The design of this peculiar organ affords another example of that beneficent wisdom, which in a study of the works of God meets us at every turn. The

\* Φάλαινα, *phalaina*, a whale (Arist.).



food of this animal consists wholly of the soft jelly-like masses (*Medusæ*) which float in the ocean, the little pellucid shrimps, &c., which so abound “as often to colour the surface of the sea,” or other creatures of very small size, the gullet being so contracted as not to receive the human hand. To seize or to masticate such prey as this, teeth would of course be utterly useless: and a provision is substituted which effectually meets the requirement. The slender and weak, but long and curved lower jaws, form the frame-work of “an enormous spoon,” which shovelling up whole hosts of prey, water and all, the mouth is closed; the water is now forcibly squeezed out through the interstices of the whale-bone plates, which are close enough to retain the food, after all the water is ejected.

The pursuit of the Greenland Whale (*B. Mysticetus*) forms no inconsiderable source of national wealth, and is important as a nursery for adventurous and hardy British seamen. It was formerly prosecuted on the East shores of Greenland; but of late years, Davis’ Straits, and the interior of Baffin’s Bay, have become the principal scenes of the enterprise. Our own ports furnish the majority of the ships engaged; chiefly those of North Britain, among which Hull, Peterhead, Dundee and Aberdeen, stand prominent. The ships usually leave the Shetland Isles in April, and proceed to their locality, which they reach in May or June. As soon as a “fish” is descried, the boats are despatched in pursuit; when approached, he is struck with a har-

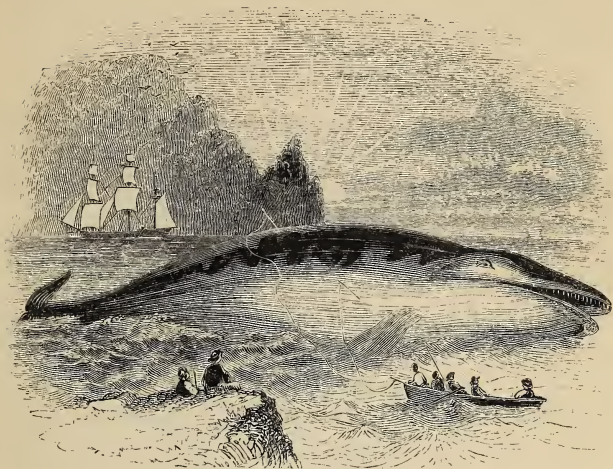
GREENLAND WHALE (*Balæna Mysticetus*).

poon, to which is attached a line of immense length. The Whale dives, and swims with great speed under water, pursued by the boats, the direction of his flight being indicated by the running out of the line. On coming fatigued to the surface to breathe, other harpoons are struck into his body, and he again dives. At length his strength is exhausted, and long steel lances, plunged into his vitals, finish the work of destruction. He is then towed alongside the ship, made fast with tackles, and the superficial blubber "flensed" off, by the men walking on the carcass with spiked shoes. Both sides being stripped, the whale-bone extracted, and the jaw-bones hoisted on deck to drain, (being full of oil,) the

carcass, or “kreng,” is cut adrift as valueless. A large Whale will frequently yield upwards of twenty tons of rendered oil ; which, with the other products, may be worth nearly a thousand pounds.

The locality in which these enterprises are prosecuted, is associated with much of difficulty, danger, privation, and hardship : ships are often crushed by the irresistible pressure of icebergs, or frozen up and fast locked in dreary ice-fields, to be imprisoned with their hapless crews, through the length of an Arctic winter, exposed to all the horrors of cold and starvation. And even the very chase itself is one of imminent peril ; the fearless seaman rushes almost into the jaws of death. The mortal struggles of the enormous animal, “making the sea to boil like a pot,” his sudden rising with immense impetus to the surface, and the fury and power with which he convulsively lashes the sea with his vast tail, with other circumstances which we cannot particularize, frequently prove the cause of sudden destruction to the ill-fated mariners.

The length of the Greenland Whale rarely now exceeds seventy feet, though individuals were formerly seen of much greater dimensions. It is probable, that, from commercial enterprise, few are suffered to attain adult size, at least in the Northern Seas. The head is about one third of the whole length. The general colour is blackish, white beneath. The affection displayed by the female *Cetacea* for their young, is in none more observable than in the present species.

*Balænoptera,\* the Rorqual.*THE NORTHERN RORQUAL (*B. Boops*).

These Whales are of rather more slender form than the preceding, and are distinguished by having a small back fin near the tail; and by the throat and belly being wrinkled with folds running down the body lengthwise. The Northern Rorqual (*B. Boops*)† is the largest of all known animals, reaching to the length of a hundred feet. It feeds on fishes of considerable size, as well as on the smaller and softer food of its fellows. It is rather avoided than pursued by whalers, on account of its ferocity, and the violent rapidity of its motions: the amount of oil produced by it, is comparatively

\* Φάλαινα, *phalaina*, a whale, and πτερόν, *pteron*, a wing, or fin.

† Βοῦς, *bous*, an ox, and ὄψ, *ops*, the eye.

small, and the whalebone short. It is common in the Arctic seas, and occasionally descends to our own shores.\*

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Thus we finish the first portion of the great chain of animated being: that most important, most interesting, and most highly endowed class of animals, which bring forth and suckle living young. While we have observed a vast variety of powers, instincts, and habits; of motion, food, and locality; we have become acquainted with the remarkable fact, that this variety is supplied, not by the creation of a new set of organs for every change, but by a modification of existing ones, few and simple in themselves, which seem to have been formed as a model from which there has been no deviation. Slight alterations in form, size, or situation, often produce a total change in use and power; and even where the alteration is at its highest, the organs are found to be essentially the same in structure, and easily recognized. And though we are about to witness still wider departures from accustomed forms, we shall find this great law still prevailing, that all the creative designs of God are fulfilled with the least possible expenditure of creative energy, the least possible waste of power.

\* A specimen has been taken in the Thames during the progress of this work.

## CLASS II.—AVES.\*

THE air is nearly as much the home of the Bird as the earth is that of the Quadruped. Its whole structure is, therefore, fitted for support and rapid progression in that fluid. In order to this, several modifications must be made in such a *model-form* as any of those we have been describing. In the first place, the weight of its bulk must be very materially lightened: on taking a dead bird into the hand, we cannot help being struck by its lightness, as compared with a quadruped of the same size. This is accomplished by hollowing out cavities in every part of the body, and even in the bones themselves, in which the air is constantly circulating, so that the whole of the interior has been said to be “bathed in air.” The bones of the limbs are strong but thin tubes, the air occupying the place of marrow. The peculiar covering of the body is remarkable, among other qualities, for its lightness in comparison with its bulk; the feathers also being penetrated by air. In fact, “the whole organization is filled with air, as a sponge with water.” Lightness alone, however, would not qualify a Bird for *flight*, but merely for floating in the atmosphere; without strong muscular power, it would be, like a tuft of thistle down, at the mercy of every blast.

\* *Avis*, a bird.



But in no animals are the muscles of the limbs more firm and compact in texture; in none are they larger; in none have they broader surfaces of attachment than in Birds. Thus, the fore limbs, lengthened and developed into vigorous and muscular *wings*, are fitted to take a strong hold of the air in their successive leaps forward, while the head with the pointed beak, cleaves the air, and the tail as a rudder steers the little aërial vessel, and gives a precise direction to the flight. But towering, as many Birds do, above the clouds, when the atmosphere is rare and cold, they require a clothing more fitted to retain the animal heat than hair, or even fur. This is given in their feathers, which are of all substances the least conductors of heat, and more particularly in the unwebbed down which lies beneath them. The thick, firm, but soft feathers on the belly of a duck, or other waterfowl, are a beautiful example of the protection afforded against cold, in circumstances where the animal is peculiarly liable to its influence.

The long quill-feathers of the wings are so placed as to present a stiff broad surface, with which to strike the air, far more completely adapted for that purpose than the stretched membrane of the Bat. The strongest are attached to the hand, one finger of which alone is developed, though the others can be traced; and the thumb, carrying a little plume of feathers, is distinct and visible. The quills of the hand and wrist are called *primaries*, those which proceed from the fore-arm are *secondaries*, and those

attached to the shoulder, the longest and most powerful bone of the wing, are *tertiaries*. The feathers that overlap the bases of these are called *coverts*, of which there are three rows, and still nearer to the body are feathers called *scapulars*. The tail consists of strong feathers resembling the quills of the wing, but having both sides even; they are usually, not always, twelve in number. Above them is a range of *tail-coverts*. All these, as well as the general scale-like feathers of the body, are beautifully and smoothly laid one upon another, an arrangement that materially facilitates the action of flying; for while on the one hand they offer no resistance to motion forward, but lie closer and closer as the pressure of the air is increased, on the contrary, the impulse backward produced by the bringing forward of the wings after each stroke, is resisted by the free edges of the feathers rising and catching the air; a resistance which increases with the pressure.

Each feather consists of two parts; a light but firm shaft formed of a pithy substance, hollowed at the lower end into a horny tube, containing the blood-vessels by which it is sustained; and the vane, a double series of parallel thin plates, one on each side the shaft, set at an angle to it, which are themselves furnished at their edges with a similar though smaller series. In all feathers which are destined to strike the air, these branchlets are hooked into one another, so as to present a continuous surface of astonishing firmness. The brilliant hues, and often

the changeable metallic or iridescent gloss of this part of the feather, are not the least worthy of admiration.

The hinder extremities are by no means so much developed as the wings: their general structure is much the same as in the *Mammalia*. Being used for various purposes, such as seizing prey, holding food to the mouth, climbing, perching, swimming, walking, &c., they of course vary in the form and relative proportions of their parts. The thigh is usually concealed within the body, what is commonly called the thigh, the “drum-stick,” being the leg, whilst this last name is as often misapplied to the long shank-like foot which rises perpendicularly from the toes. The general number of toes is four; three are usually directed forwards and one backwards; some, as the Swallows, have all four pointed forwards, and others, as the Parrots and Wood-peckers, have two in front and two behind. Some running birds, the Bustards and the Cassowaries, have but three, and the Ostrich has but two, placed forwards.

The jaws are much altered, being lengthened into two horny projecting mandibles, forming a bill or beak. While this organ retains its general character in all birds, it is susceptible of great variation in form and size. It is now a pair of sharp and formidable pincers for tearing flesh; then a wedge-shaped chisel to bore living wood; or a slender probe to insert into minute crevices; now it becomes a long and pointed spear for transfixing fishes; now a pair of oval plates for dabbling in the slushy ooze; and again it is transformed into a hollow scoop for

shovelling small prey from the surface of the ocean. From the modification of the bill and feet, the characters used to divide the Class into Orders are taken.

Birds, in common with all vertebrate animals, except *Mammalia*, produce their young in a very incipient state of developement, enclosed within an egg. The egg of this Class, however, differs from others in having a hard brittle shell, composed chiefly of lime, and in being hatched by the heat of the parent's body during *sitting*. The globular yellow mass within, called the yolk, is gradually absorbed into the bowels of the chick, forming its nutrition.

In order to economize the animal heat while the mother is sitting, and to prevent its too rapid abstraction, when she is compelled to leave the eggs, as well as to protect them from accidental injury, that beautiful and admirable piece of workmanship, the result of untaught and unpractised instinct, the *nest*, is constructed. Various extraneous materials are used for this purpose, and very different degrees of skill and care lavished on the structure. The tender solicitude of the mother bird for her young, in tending and feeding them as long as they continue in the nest, and often for some time afterwards, has afforded the most touching metaphors and symbols in all ages; and has been used even by God himself to shadow forth his fatherly love and providential care.\*

\* Deut. xxxii. 11; Matt. xxiii. 37.

Although this is not the place to enter into details of anatomy, there are yet one or two of the bones which we may slightly notice. The most remarkable bone in the skeleton is the breast-bone, (*sternum*), which is very large, spreading, like a shield, over the bowels. From its surface rises a projecting plate, affording, with the sides, a large surface for the attachment of the strong muscles that produce the downward stroke of the wing. The great muscular force necessary for this motion, of course, has a tendency to draw the shoulders towards each other, but this is effectually resisted by the expansive power of the united *clavicles*, called the forked bone, or, more familiarly, the “merry-thought.” The greater the power of flight, the more this bone is arched, and the stronger is its resistance. The spine has very little motion, the joints being, as it were, soldered together, and the ribs are nearly fixed; the skeleton thus resembles a hollow box of bone, with little power of motion in its several parts, except in the limbs.



THE HARPY EAGLE (*Harpia Destructor*) and SECRETARY (*Gypogeryx Serpentarius*).

ORDER I.—ACCIPITRES.\*

THE highest station has usually been assigned to the Ravenous Birds, partly because of the false medium through which the vitiated taste of fallen man has been always accustomed to view mere animal courage and daring violence, and partly because of the muscular power, keen senses, and high develop-

\* *Accipiter*, a hawk.



ment of all their organs, which their rapacious mode of life renders indispensable.

Representing the *Carnivora* among the quadrupeds, the *Accipitres* are furnished with weapons not less formidable than theirs, nor less adapted for seizing and tearing the flesh of animals. Their large curved talons are longer, more powerful, and sharper than those of the Cats; while the hooked bill, notched in sharp angular forms, supplies the place of lacerating teeth. They naturally separate into two subdivisions, those which seek their food by day, and those which prey by night. The former are by far the more numerous, and possess in greater perfection the organization peculiar to the order. The base of the bill in these is covered with a membrane called the *cere*, in which the nostrils are placed; the toes, three before and one behind, are without feathers; the plumage is close, strong, and firm in texture; the wings, long and very powerful. These form two great families, the Vultures and the Falcons.

*Vultur,\* the Vulture.*

Voracious and disgusting in their propensities, unpleasing in their form, lazy and cowardly in their habits, the Vultures yet fill a highly useful station in the world of nature. They manifest in a less degree than most of their order those powers for which it is distinguished, more frequently preying on carrion, the flesh of dead or dying animals, than

\* Its Latin name.

seizing those which are in health and vigour, thus representing the Hyenas and Jackals. Like them, however, they sometimes attack living animals, and, being of large size, many of them are formidable assailants. They fly at a great height, hovering in the air, or sailing slowly along in great circles, until they discover a carcass, when, trooping towards it from all quarters of the sky, they gorge themselves with the putrid banquet, until they have scarcely power to move. Audubon's experiments seem satisfactorily to have proved, that the discovery of prey is owing to their acuteness of sight, and not at all to that of smell, as had been universally supposed.

The Condor of the Andes (*Sarcoramphus\** *Gryphus*) is the largest of the tribe, though its size has been very much exaggerated. The expanded wings occasionally, but rarely, measure fourteen feet, and the length of the body is about three feet and a half. It belongs to a division marked by the possession of fleshy caruncles or prominences on the cere, somewhat like those of the Turkey-cock, and sometimes tinged with brilliant colours. When pressed by hunger, the Condor descends from its lofty mountain peaks to attack the lamas, or the calves in the pastures, and two of them will even succeed in destroying a cow; but carrion is its favourite repast. Indeed, the whole tribe may be considered as the scavengers of the warmer climates, where putrescence follows so soon after death; and, because of

\* Σάρξ, *sarx*, flesh, and ῥάμφος, *rhampfos*, a beak.

their utility in removing such nuisances, they are generally protected and favoured.

The Læmmer-geyer (*Gypaëtos*\* *Barbatus*) of the Alps, is scarcely inferior in size to the last, and superior in strength and ferocity; being the connecting link with the Eagles. It is said even to attack man, if found sleeping, and children have been carried off by it. The head and neck, which are naked in the true Vultures, are here clothed with feathers.

The Falcons are a very numerous division of the birds of prey, comprising many genera. In them, the structure suited to their carnivorous habits is carried to its highest pitch of developement, though even in them there is much variation of strength and courage. Their countenance wears an aspect of savage dignity, arising from the projecting and lowering eye-brow, which gives them a constant frown. Most of them feed exclusively on living animals, which they seize by open violence, striking them with their formidable talons. The use made of the true Falcons, in the exciting sport called Hawking, so eagerly pursued by our ancestors, has acquired for them the epithet of “noble,” in contrast with those called “ignoble,” which cannot be so employed.

*Falco*,† *the Falcon*.

We select the Jer-Falcon (*F. Islandicus*) as an illustration of this genus, the most noble of all the

\* Γύψ, *gyps*, a vulture, and ἀετός, *aëtos*, an eagle. † Its Latin name.

PEREGRINE FALCON (*Falco Peregrinus*).

Falcons; “ the boldest, the most perfectly winged, and, in proportion to its weight, the strongest both for action and endurance of all the feathered tribes.”\* The bill of this bird is remarkable for its strength, sharpness, and cutting power; “ there is no soft part of an animal which it will not divide with the greatest ease. It is also well formed for pulling feathers; and by means of it the Falcon can deplume her game as neatly and with as little injury to the flesh as the most expert poulterer. It can also cut

\* Mudie, Birds, p. 97.

open the birds, divide the tendons and ligaments, and, when scarcity of prey renders economy necessary, it can separate all the joints, and leave not an atom of eatable matter on the bones.”\* The beak of this bird, as in all the genus, is armed near the tip with a sharp tooth, received into an answering notch in the lower mandible. The genus evidently represents the Cats, as the Vultures do the Hyenas and Dogs. They range over a great geographical extent, but chiefly inhabit northern regions. The Jer-Falcon is the largest of the “*noble*” birds of prey, as the Merlin (*F. Æsalon*) is the smallest. The latter, from its diminutive size, being no larger than a Blackbird, and, from its gentle docility, was the favourite of the ladies, a character alluded to in the beautiful lines of Spenser:—

A Merlin small she held upon her hand,  
 With hood and jessie gallantly bedight;  
 But little did he need or hood or band;  
 Could he but gaze on her, full safe were he from flight.

*Aquila,† the Eagle.*

Stern and unsociable in their character, yet confident in their great strength, and efficient means of defence, the Eagles delight to dwell in the solitude of inaccessible rocks, on whose summits they build their rude nest, and sit in lone majesty, while with their keen and piercing eye they sweep the plains below, even to the horizon. Hence, bold and

\* Mudie, Birds, p. 168.

† Its Latin name.

GOLDEN EAGLE (*Aquila Chrysaetos*).

fearless, they sally forth; and, swooping from their towering height, bear their paralysed victim aloft in their powerful talons. Being the largest of the Rapacious birds, and possessing a courage and ferocity answering to their size, they disdain the small booty of other Falcons, and select such prey as lambs, fawns, or calves, and even the fox and the dog. Records exist of children, of four or five years old, having been snatched away by them, which seem too circumstantial to be denied. These feats are chiefly ascribed to the Golden Eagle (*Aquila Chrysaetos*)\* of our own country, and indeed of the whole northern hemisphere.

\* *Χρυσος*, *chrysos*, gold, and *ἀετός*, *aëtos*, an eagle.



The Fisher Eagles (*Haliaëtus*)\* are scarcely if at all inferior to these in size and strength; and though their appetite inclines them to feed chiefly upon fish, yet this diet is occasionally varied with more solid animal food. The large and interesting bird which the Americans have chosen as the emblem of their young and vigorous republic, the White-headed, or, as it is usually called by them, the Bald Eagle (*H. Leucocephalus*),† is a fair specimen of the genus. Its oppressive abuse of superior might in robbing its weaker but more industrious relative, the Fish-hawk (*H. Ossifragus*),‡ of the fish which he has caught, are beautifully and even sublimely sketched by Wilson, in a passage which can never be too often quoted: “In procuring” his prey, “he displays in a very singular manner the genius and energy of his character, which is fierce, contemplative, daring, and tyrannical; attributes not exerted but on particular occasions; but, when put forth, overpowering all opposition. Elevated on the high dead limb of some gigantic tree, that commands a wide view of the neighbouring shore and ocean, he seems calmly to contemplate the motions of the various feathered tribes that pursue their busy avocations below; the snow-white Gulls slowly winnowing the air; the busy *Tringa* coursing along the sands; trains of Ducks streaming over the surface; silent and watchful Cranes, intent and wading; clamorous Crows; and

\* Ἀλς, *hals*, the sea, and ἄετός, *aëtos*, an eagle.

† Λευκος, *leucos*, white, and κεφαλη, *kephale*, the head.

‡ *Ab ossibus frangendis*, PLIN. from breaking bones.

all the winged multitudes that subsist by the bounty of this vast liquid magazine of nature. High over all these hovers one, whose action instantly arrests his whole attention. By his wide curvature of wing, and sudden suspension in air, he knows him to be the Fish-hawk, settling over some devoted victim of the deep. His eye kindles at the sight, and balancing himself with half-opened wings on the branch, he watches the result. Down, rapid as an arrow from heaven, descends the distant object of his attention, the roar of its wings reaching the ear as it disappears in the deep, making the surges foam around ! At this moment the eager looks of the Eagle are all ardour ; and levelling his neck for flight, he sees the Fish-hawk once more emerge, struggling with his prey, and mounting in the air with screams of exultation. These are the signal for our hero, who, launching into the air, instantly gives chase, and soon gains on the Fish-hawk ; each exerts his utmost to mount above the other ; displaying in these rencontres the most elegant and sublime aerial evolutions. The unencumbered Eagle rapidly advances, and is just on the point of reaching his opponent, when, with a sudden scream, probably of despair and honest execration, the latter drops his fish ; the Eagle, poising himself for a moment, as if to take a more certain aim, descends like a whirlwind, snatches it in his grasp ere it reaches the water, and bears his ill-gotten booty silently away to the woods.”\*

We are compelled reluctantly to pass over with

\* Amer. Ornith. vol. i. p. 23. (Constable's edition.)

a bare enumeration the magnificent and terrific Harpy of South America (*Harpyia Destructor*), the largest bird of the Order; the Hawks, the Fork-tailed Kites, and the cowardly but insidious Buzzards; nor can we pause to dwell upon the singular form of the Secretary Falcon of South Africa (*Gypogeryan\* Serpentarius*), the great length of whose feet (or legs so called) gives it a resemblance to one of the Wading birds. It hunts serpents and other reptiles chiefly on the ground.

Those birds of prey whose organization is adapted for activity only during the twilight and night, form a very striking and natural genus, named

*Strix,† the Owl.*

They are readily distinguished by the largeness of their globular head, their flattened face, their large and dilated eyes, situated at the bottom of a shallow cone of feathers, their round beak almost hidden in these feathers, their sharp, curved talons, their soft unwebbed puffy plumage, and the peculiarly silent character of their flight. Their wide pupil is ill-fitted for vision in the strong day, during which they sit erect and motionless, winking their eyes, with a ludicrous gravity: and if disturbed at this time, as if conscious of their disadvantage, they seem unwilling to fly, but stare upon the intruder, draw themselves into a more erect attitude, and make odd

\* Γύψ, *gyps*, a vulture, and γέρανος, *geranos*, a crane.

† Its Latin name.

gesticulations, and hissing sounds. But on the approach of evening all this awkwardness and apparent stupidity vanishes; they become watchful, lively, and animated; with the eye dilated like a moon,



THE BARN OWL (*Strix Flammea*).

they investigate every corner, gliding to and fro with great activity, lowering and protruding their head in all directions. The small quadrupeds which run abroad in the gloaming are their natural prey; the largest species, such as that "great northern hunter," the Snowy Owl (*S. Nyctea*), the Eagle Owls of Europe and America (*S. Bubo*, and *S. Virginiana*), pounce upon hares, rabbits and squirrels, ducks, grouse, &c.; while the smaller, but much more useful kinds, wage unceasing and successful war

upon the various species of field mice and voles, that so largely consume the harvest of the husbandman. White says, "About an hour before sunset, (for then the mice begin to run,) they sally forth in quest of prey, and hunt all round the hedges of meadows and small enclosures for them, which seem to be their only food. In this irregular country, we can stand on an eminence and see them beat the fields over like a setting-dog, and often drop down in the grass or corn. I have minuted these birds, with my watch, for an hour together, and have found that they return to their nest, the one or the other of them, about once in five minutes; reflecting, at the same time, on the adroitness that every animal is possessed of, as far as regards the well-being of itself and offspring."\* Mr. Jenyns also confirms the accuracy of this statement, from his own observation. Thus, it appears that our commonest species, the Barn or Screech Owl (*S. Flammea*), the one alluded to above, is a most industrious and valuable friend of the farmer, and deserving of far more respect and consideration than it receives. Looked upon with contempt, as a stupid insensible creature, or regarded with a superstition still more degrading, as the harbinger of mischief and death, the poor Owl obtains no quarter when it unfortunately falls into the merciless hands of the vulgar, who, with a blindness to their own interest by no means unusual, destroy friends as if enemies. Its sad and wailing cry, uttered in the silence of the

\* Nat. Hist. Selb. Jenyns' Ed. p. 206.

night, its silent ghost-like flight, the lonely gloomy spots which it loves to haunt,—characters which are common to the whole genus,—have, perhaps, in some measure, induced the popular abhorrence which has fallen to its lot. It is the province of the Naturalist, however, to combat absurd prejudice, and to allot to every creature, as far as possible, its true character. The voices of the larger species are, it must be confessed, anything but agreeable: Wilson, with his usual felicity, has given a description of the nightly serenade of the great Eagle Owl of the United States, (*S. Virginiana*), to the truth of which the writer of the present work can witness, having often heard it in the lone forests of West Florida. “His favorite residence is in the dark solitudes of deep swamps, covered with a growth of gigantic timber; and here, as soon as evening draws on, and mankind retire to rest, he sends forth such sounds as seem scarcely to belong to this world, startling the solitary pilgrim as he slumbers by his forest fire,

‘ Making night hideous.’

“Along the mountainous shores of the Ohio, and amidst the deep forests of Indiana, alone, and reposing in the woods, this ghostly watchman has frequently warned me of the approach of morning, and amused me with his singular exclamations, sometimes sweeping down and around my fire, uttering a loud and sudden *Waugh O! Waugh O!* sufficient to have alarmed a whole garrison. He has other nocturnal solos, no less melodious; one of which



very strikingly resembles the half suppressed screams of a person suffocating, or throttled, and cannot fail of being exceedingly entertaining to a lonely benighted traveller, in the midst of an Indian wilderness!"\* This bird belongs to the division which has two singular tufts of feathers on the head, resembling horns, when elevated. The whole tribe build a rude nest, chiefly composed of sticks, covered with a bed of feathers, and usually concealed in a hollow tree, or similar place.

We know little of the relation which undoubtedly exists between the colours and the instincts of animals; it seems evident, from the precision and uniformity of the prevailing tints allotted to certain groups, that they are not distributed at random, but are as characteristic as the peculiarities of form and habits. We may venture to point out what appears to us a singular coincidence in this respect, between the carnivorous quadrupeds and birds; the almost universal prevalence of *dark spots* or *streaks* upon a *yellowish ground*. Even the exceptions seem to be paralleled; such as the unspotted tawny hue of the Lion and the Eagle, the black and grey of the Dogs and the Vultures, and the bluish grey of some of the smaller Hawks and the Lynxes.†

\* Am. Orn. vol. i. p. 100.

† When the above was written, I was not aware that the subject had ever been alluded to; but I have since had the pleasure of observing, that Mr. Swainson has taken nearly the same view, in his work on the Classification of Quadrupeds.

## ORDER II.—PASSERINÆ.\*

A VERY numerous and heterogeneous assemblage of genera are united under the above name, distinguished by scarcely a single peculiarity from other orders, except the absence of such characters as mark *them*. Even the structure of the feet, adapting them for sitting on horizontal branches and twigs, and which has been seized to institute another name for the Order, that of *Insessores*, or Perchers, is possessed in common with the rapacious tribes, and with some of the Gallinacæ. Still, however, they do group together, though awkwardly; and the genera, though varying exceedingly in size, form, and habits, yet pass into each other by gradations so insensible, that they cannot be separated from each other. The investigation of the species, which exceed in number those of all the other Orders together, is aided by their sub-division into five sub-orders or families; distinguished by the structure of the bill, in all except in one, which is named from the formation of the feet.

## FAM. I.—DENTIROSTRES.\*

The distinguishing character of this family is a notch on each side of the upper mandible, near the point, most manifest in the Shrikes, displaying their relationship to the Falcons, but becoming in the

\* *Passer*, a sparrow.† *Dens*, a tooth, and *rostrum*, a beak.

Warblers hardly perceptible. The genera are very numerous, scattered over the globe, but we can notice only a few of the more prominent.

*Lanius,\* the Shrike.*

The most carnivorous among the insect-eating races, the Shrikes, in their attacks upon small birds, manifest a ferocity and a daring scarcely inferior to the Falcons. Perched upon a projecting spray, they sit for hours patiently watching for the casual appearance of some large beetle or grasshopper, or some small bird, when they dart suddenly upon it, seize it with their strong and sharp beak, (not with the feet,) and strangle it instantly. The prey thus taken, they have the very remarkable habit of impaling upon thorns or similar projections, where they may occasionally be seen remaining, the bird often leaving them. From this habit, the genus has obtained the common name of Butcher-bird, as well as its scientific appellation signifying the same thing. The object of the singular instinct appears to be, to fix the prey while it is torn into morsels with the beak, the feet and claws being weak and insufficient for this purpose. Mr. Selby, in his *Illustrations of British Ornithology*, informs us, "I had the gratification of witnessing this operation of the Shrike (*L. Excubitor*) upon a Hedge Chanter (*Accentor Modularis*) which it had just killed, and the skin of which, still attached to the thorn, is now in my possession. In this instance, after killing the bird,

\* *Lanius*, a butcher.

it hovered with it in its bill for a short time over the hedge, apparently occupied in selecting a thorn for its purpose. Upon disturbing it, and advancing to the spot, I found the Chanter firmly fixed by the tendons of the wing at the selected twig.”\* The Shrikes chiefly inhabit woods, coppices, &c., on the margins of which they find their prey most abundant. The prevailing colours of the European species are ashy grey and white, with a tendency to red in some parts, and the breast marked with delicate wavy lines of brown. Some foreign species, however, are very richly coloured. They are, generally, about the size of the Thrushes, to which they shew a great resemblance, and into which genus the species merge by an insensible gradation.

*Turdus,† the Thrush.*

Scarcely to be distinguished from the Shrikes by any strongly marked character, the Thrushes have the notches of the bill less deep, the point less hooked, and the toes more fitted for walking. They extend into colder climates, and live chiefly upon snails, slugs, and soft worms, occasionally, however, eating pulpy berries in winter. Many of them are noted for their musical powers: and one in particular, the Mocking-bird of America (*T. Polyglottus*), has perhaps no successful rival in nature’s whole orchestra. Besides its own powers of song, which is inimitably beautiful, it has the faculty of appro-

\* Vol. i. p. 141.

† Its Latin name.

priating the songs of all other birds, and even other sounds, reproducing them with a truth, precision, and delicacy, truly wonderful. Wilson's exquisite description of the Mocking-bird, is, we regret to say, too long for our pages. Our own Blackbird (*T. Merula*), Thristle (*T. Musicus*), Mavis (*T. Iliacus*), Missel Thrush (*T. Viscivorus*), &c., are also distinguished songsters. The general tint is brown, distributed in minute dashes or spots on the under parts; some of the African Thrushes have splendid metallic hues, like browned steel.

The Ant-thrushes (*Myothera*\*) of the tropical regions of both continents are also birds of brilliant plumage. The tail is short, but the legs and feet are long and fitted for walking on the ground, where they obtain their subsistence by feeding on ants and termites: they rarely fly. Allied to these in form, is the Dipper or Water Ousel (*T. Cinclus*) of our own country, whose singular habit of walking at the bottom of water, in search of aquatic larvæ, &c., shews a beautiful analogy with the true Wading birds.

*Muscicapa*,† the *Fly-catchers*.

Leading away from the Shrikes by another road, and gradually approaching the Wagtails and other warblers, the Fly-catchers form another of the great branches of this numerous family. They have a rather broad flattened bill, the point a little

\* *Μυῖα*, *myia*, a fly, and *θηρέω*, *thereuo*, to hunt.

† *Musca*, a fly, and *capio*, to take.

hooked, and the base furnished with stiff projecting bristles, whose office is to assist in confining the struggles of the active prey which they pursue. In habit they resemble the Shrikes, as much as in form : sitting on a post, or the summit of a bush, they sally out upon passing winged insects, capture the prey by a snap of the beak, and immediately return *to the same spot* to eat it. In this remarkable peculiarity of alighting to eat each capture, they differ from the Swallows, which eat on the wing, and resemble the Dragon-flies among insects.

Through the chastely coloured and silky Chatterers (*Ampelis*),\* the brilliant tinted Tanagers (*Tanagra*),† and Orioles (*Oriolus*),‡ and the singular Lyre-bird (*Mænura*§ *Lyra*), remarkable for its size and the developement of two ribbon-like feathers in the tail, curved like the arms of a lyre,—we come to the great genus

*Motacilla*,|| the Warblers.

The beak has now become straight and slender ; still, however, having in some species the flattened form of the preceding genus, and in others the curved point of the Shrikes. These also are fly-catchers ; but instead of watching for their prey, they seek it most industriously among the twigs and

\* Ἀμπελος, *ampelos*, a vine.

† Τανάγρα, *tanagra*, a brazen vessel.

‡ Ὠρίων, *horion*, the Greek name of a bird.

§ Μήνη, *mene*, the moon, and οὐρά, *oura*, the tail.

|| *Motacilla*, a Wagtail. (Lat.)



leaves of trees. Extended over the whole globe, their office is to keep down the myriads of little insects, so small as to be almost invisible to man; but which, from their numbers, would otherwise be very injurious to vegetation. “The chief peculiarity which runs through this numerous family, is the very small size and delicate structure of its individuals. Excepting the Humming-birds, we find among these elegant little creatures, the smallest birds in creation. The diminutive Golden-crests (*Regulus*),\* the Nightingale (*Philomela* † *Luscinia*), the White-throat (*Curruca* ‡ *Cinerea*), and the Wood-



THE NIGHTINGALE (*Philomela Luscinia*).

\* *Regulus*, a little king. † Φιλέω, *phíleo*, to love, and Μέλος, *melos*, song.

‡ *Curruca*, some small bird, in Latin.

wren (*Sylvia*\* *Sibilatrix*), are all well-known examples of genuine warblers, familiar to the British naturalist."† In fact, most of the little birds which hurry to and fro amongst the quivering leaves, making the lone woods cheerful with their joyous songs, belong to this great family; not only in this, but in all countries.

## FAM. II.—CONIROSTRES.‡

This also is a numerous division, comprehending many well-known birds, distinguished by the short, thick, conical bill, stronger and stouter in proportion as they feed more exclusively on seeds. The Tanagers, placed by Cuvier in the last family on account of their bill being strongly notched, possess the same form of that organ as the present family, though they are almost wholly insect-eaters. Thus they form one of the many connecting links between the two families.

Though found in all countries, they seem to be appointed chiefly for such as are temperate and cold; where they are generally permanent inhabitants. While, perhaps, they cannot altogether be acquitted of the charge of occasionally feeding on the grain of the husbandman, they doubtless perform a service far more than equivalent, in accumulating in vast flocks on the fields in winter, to devour the minute seeds abundantly shed from weeds, which no culture can destroy.

\* *Sylva*, a wood. † Swainson, in *Cab. Cyc.* "Birds." Vol. ii. p. 38.

‡ *Conus*, a cone, and *rostrum*, a beak.

*Parus,\* the Tits.*LONG-TAILED TIT (*P. Caudatus*), AND NEST.

The well known, saucy, and most perseveringly active little creatures, commonly called Titmice, have a bill remarkably small, but very strong and efficient. They feed indifferently on seeds or insects, which latter they search for with unwearied industry, prying into every little crevice about the branches of trees. Few birds construct nests so snug and compact as these, of which the bottle-like nest of the Long-tailed Tit (*P. Caudatus*) is a familiar example.

\* The Latin name of the genus.

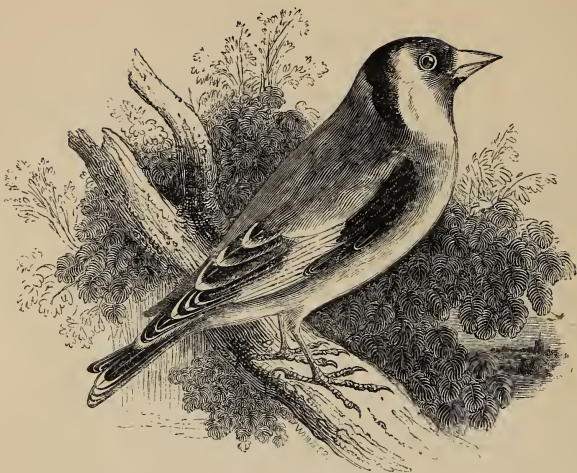
*Alauda,\* the Larks.*

Another genus of mixed feeders, but evincing more preference for seeds than the Tits. Their situation is on the ground, where they build their nests; for walking on which the claw of the hind toe is greatly lengthened. Our own sweet Sky-lark (*A. Arvensis*), whose morning melody, poured forth as he soars perpendicularly into the sky, has afforded so many beautiful images to the poets,—is a good example of the genus.

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The Buntings (*Emberiza*) and the Finches (*Fringilla*), with increasingly conical bills, lead on to the thick, short, but greatly enlarged bills of the Bullfinches and Crossbills. The beautiful and docile Goldfinch (*F. Carduelis*) and the Canary (*F. Canaria*), those favourites of the boudoir, with the silent but impudent House Sparrow (*F. Domestica*), will sufficiently illustrate the former, connected with the latter through the Linnets (*F. Linaria*), &c. The showy plumage, as well as the clear and musical song of the Cardinal Grosbeak (*Loxia Cardinalis*), has made him a favourite cage-bird, especially in America, his native country. The beak of the Cross-bill (*L. Curvirostra*) is singularly formed, the points crossing each other when at rest: a structure enabling it to wrench asunder the scales of the pine-cones, and to extract the seeds, on which it feeds.

\* The Latin name.

THE GOLDFINCH (*Fringilla Carduelis*).

Neglecting some intermediate forms, chiefly of foreign locality, we come to some birds of larger size, firm and glossy plumage more or less adorned with metallic tints, strong bills, and rather large feet. They form three genera,—the Crows, the Birds of Paradise, and the Rollers.

*Corvus*,\* *the Crows*.

Respecting the first of these, including the Magpie (*C. Pica*), and the Jays (*C. Glandarius*, &c.), it is not necessary to say much. Their cunning, voracity, sociality, and clamour, as well as their thievish propensities are well known. Their prevailing tint, deep black, is glossed with steel-blue, or metallic

\* The Latin name.



THE MAGPIE (*Corvus Pica*).

green; the Jays, however, are elegantly varied with azure and purple. They are chiefly ground-feeders, searching for worms and larvæ in the earth; but some of them do not scruple to pursue small birds.

*Coracias,\* the Rollers.*

The European Roller (*C. Garrula*) is, perhaps, one of the most beautifully coloured birds we have; its plumage being painted with bright green, azure, and fawn colour. In habits these birds much resemble the Jays, but are less familiar.

\* *Kógaž*, *korax*, a raven.



*Paradisea,\* the Bird of Paradise.*BIRDS OF PARADISE (*P. Apoda* AND *P. Superba*).

The occasional introduction into Europe of mutilated skins of these magnificent birds, coming from the farthest islands of the gorgeous East, had for a long time given just sufficient knowledge of them to found and build up a fanciful and extravagant theory of their faculties and habits. The unsightly

\* Παράδεισος, *Paradeisos*, Paradise.

feet having been invariably cut off in preparing the skin, and the intestines withdrawn, the bird was fabled to be without feet, and, therefore was a permanent inhabitant of the air, or rested only suspended by its long feathers: and, having no bowels, it of course lived without food, its subsistence being derived from dew, vapours, and similar light diet. It is superfluous to add that these are idle fables, that the Birds of Paradise are in no respect essentially different from others, save in the splendid beauty of their plumage; and even in this particular they are, perhaps, equalled if not surpassed. Round the base of the bill grows a mass of velvety feathers, most richly adorned with metallic lustre; while from the sides of the body, under the wings, grow long plumes, singularly disposed in bunches, of great softness and beauty, used by ladies for head-dresses. From the rump proceed two long bearded shafts, curled at the end into a rounded disk. Some of the species, however, have these peculiarities scarcely at all developed. The Emerald Bird of Paradise (*P. Apoda*) is that most commonly brought to this country. They inhabit New Guinea, and the neighbouring islands, where they are said to associate in flocks, and to feed on fruits.

M. Lesson, who during a stay of about a fortnight at the Island of New Guinea attentively studied their habits, has given us a few interesting particulars. He says,—“The Emerald (*P. Apoda*), the only one of which we have any certain information, lives in troops in the immense forests of the

Papuan Isles. They are birds of passage, changing their residence according to the monsoons. The females associate in flocks, on the loftiest trees, and all cry together to attract the males. The latter are always single in the midst of about fifteen females which compose their seraglio, in the manner of the Gallinaceous birds. . . .

“We observed the Manucode (*P. Regia*) twice in our shooting excursions, and killed both the male and the female. This species appears to be monogamous, or perhaps separates into pairs at the time of laying. This bird has no brilliancy in the woods, as its splendid plumage is not then observable, and the tints of the female are dull. It delights to station itself on the teak trees, whose ample foliage shelters it, and on whose small fruit it feeds.

“Soon after we arrived in this land of promise for the naturalist, I went on a shooting excursion. I had scarcely entered those ancient forests, whose sombre depth was perhaps the most magnificent and stately sight that I had ever beheld, when a Bird of Paradise met my view: it flew gracefully and in undulations; the feathers of its sides forming an elegant and airy plume, which, without exaggeration, bore no slight resemblance to a brilliant meteor. Surprised, astounded, enjoying an inexpressible gratification, I devoured this magnificent bird with my eyes; but my emotion was so great, that I forgot to shoot it, and did not remember that I had a gun in my hand till it was far away.

“The Emerald when alive is about the size of the

common Jay ; its beak and feet are bluish, its eyes brilliant yellow : its motions are lively and agile, and in general it never perches but on the summits of the loftiest trees. When it does descend, it is to eat the fruit of the smaller trees, or to seek shelter from the power of the sun. It shews a preference for certain trees, and makes the forest echo with its voice. This habit became fatal to it, indicating to us the position and motions of the bird : we were on the watch for it, and thus succeeded in killing these birds : for when a male Bird of Paradise on alighting hears a rustling in the silence of the forest, he becomes silent and motionless. His call is *voike, voike, voike, voiko*, strongly articulated. The cry of the female is similar, but much more feeble. The latter is deprived of the brilliant plumage of the male, being clothed in sober attire : we met with them congregated in scores on every tree, while the males, always solitary, were rarely seen. At sunrise and sunset, the Bird of Paradise seeks its food : during the middle of the day, he remains hidden beneath the spreading foliage of the teak tree, appearing to dread the scorching heat of the sun, or exposure to the assaults of a rival.

“ To shoot the Bird of Paradise it is necessary to leave the ship early in the morning, to arrive at the foot of a teak or fig-tree, which they frequent for the fruit, before half-past four, and to remain quiet till some of the males, impelled by hunger, alight on the branches within shot. It is indispensable to have a gun that will carry far with effect,

and that the shot should be large, for it is very difficult to kill an Emerald outright, and if only wounded, he is often lost in the dense thickets.

“The Little Emerald (*P. Papuensis*) feeds on many substances, doubtless, in a state of freedom. I can affirm that it eat the seeds of the teak-tree, and a fruit called *amihou*, of a rosy-white, insipid, and mucilaginous, of the size of a small fig, and belonging to a tree of the genus *Ficus*. Two which were kept in a cage for more than six months at Amboyna, were fed with boiled rice, but evinced a special fondness for cockroaches.”

Mr. George Bennett describes at some length a specimen (*P. Apoda*) which he saw in the aviary of Mr. Beale at Macao, where it had lived nine years, having been originally received from the Moluccas. “This elegant creature has a light, playful, and graceful manner, with an arch and impudent look; dances about when a visitor approaches the cage, and seems delighted at being made an object of admiration: its notes are very peculiar, resembling the cawing of the raven, but its tones are far more varied. During four months of the year, from May to August, it moults. It washes itself regularly twice daily, and after having performed its ablutions throws its delicate feathers up nearly over its head, the quills of which feathers have a peculiar structure, so as to enable the bird to effect this object. Its food during confinement is boiled rice, mixed up with soft egg, together with plantains, and living insects of the grasshopper tribe; these insects, when thrown

to him, the bird contrives to catch in his beak with great celerity; it will eat insects in a living state, but will not touch them when dead.

“ I observed the bird, previously to eating a grasshopper, given him in an entire or unmutilated state, place the insect upon the perch, keep it firmly fixed with the claws, and, divesting it of the legs, wings, &c., devour it, with the head always placed first.

“ The sounds uttered by this bird are very peculiar; that which appears to be a note of congratulation resembles somewhat the cawing of a raven, but changes to a varied scale in musical gradations, as *he, hi, ho, haw*, repeated rapidly and frequently, as lively and playfully he hops round and along his perch, descending to the second perch to be admired, and to congratulate the stranger who has made a visit to inspect him; he frequently raises his voice, sending forth notes of such power as to be heard at a long distance, and as it would scarcely be supposed so delicate a bird could utter: these notes are *whock, whock, whock, whock*, uttered in a barking tone, the last being given in a low note as a conclusion.

“ A drawing of the bird, of the natural size, was made by a Chinese artist. This was taken one morning to the original, who paid a compliment to the artist by considering it one of his own species. The bird advanced stedfastly to the picture, uttering at the same time its cawing congratulatory notes; it did not appear excited by rage, but pecked gently at the representation, jumping about the perch, knocking its mandibles together with a clattering



noise, and cleaning them against the perch, as if welcoming the arrival of a companion.

“One of the best opportunities of seeing this splendid bird in all its beauty of action, as well as display of plumage, is early in the morning, when he makes his toilet: the beautiful sub-alar plumage is then thrown out, and cleaned from any spot that may sully its purity, by being gently passed through the bill; the short, chocolate coloured wings are extended to the utmost, and he keeps them in a steady flapping motion, as if in imitation of their use in flight, at the same time raising up the delicate long feathers over the back, which are spread in a chaste and elegant manner, floating like films in the ambient air. In this position the bird will remain for a short time, seemingly proud of its heavenly beauty, and in raptures of delight with its most enchanting self; it will then assume various attitudes, so as to regard its plumage in every direction.

“I never yet beheld a soil on its feathers. After expanding the wings, it would bring them together, so as to conceal the head, then bending it gracefully, it would inspect the state of its plumage underneath. This action is repeated in quick succession, uttering at the same time its croaking notes; it then pecks and cleans its plumage in every part within reach, and throwing out the elegant and delicate tuft of feathers underneath the wings, seemingly with much care, and with not a little pride, they are cleaned in succession, if required, by throwing them abroad, elevating, and passing them in succession through

the bill. Then turning its back to the spectator, the actions above-mentioned are repeated, but not in so careful a manner: elevating its tail and long shaft feathers, it raises the delicate plumage of a similar character to the sub-alar, forming a beautiful dorsal crest, and, throwing its feathers up with much grace, appears as proud as a lady dressed in her full ball-dress. Having completed the toilet, he utters the usual cawing notes, at the same time looking archly at the spectators, as if ready to receive all the admiration that it considers its elegant form and display of plumage demands: it then takes exercise by hopping in a rapid but graceful manner, from one end of the upper perch to the other, and descends suddenly upon the second perch, close to the bars of the cage, looking out for the grasshoppers which it is accustomed to receive at this time.

“His prehensile power in the feet is very strong, and, still retaining his hold, the bird will turn himself round upon the perch. He delights to be sheltered from the glare of the sun, as that luminary is a great source of annoyance to him, if permitted to dart its fervent rays directly upon the cage. The iris frequently expanding and contracting, adds to the arch, wicked look of this animated bird, as he throws the head on one side to glance at visitors, uttering the cawing notes, or barking aloud, to the astonishment of the auditors. Having concluded, he jumps down to the low perch in search of donations of living grasshoppers, seemingly in the most happy and good-humoured manner.”\*

\* Wanderings in New South Wales, &c., vol. ii. p. 41.

## FAM. III.—TENUIROSTRES.\*

In this division the bill is more or less slender, and often lengthened; it is generally, however, firm and strong in texture, and is chiefly used for probing crevices in the bark of trees, holes in walls or pales, or deep-tubed flowers. Many of the genera are remarkable for the celerity of their motions, their great power of wing, their splendid hues, and their diminutive size. They are all insect-eating birds, but some of the genera suck the nectar of flowers also.

*Sitta, the Nuthatch.*

Much resembling in habits the true climbing birds, the Nuthatches have still but one of the toes directed backwards, which is, however, much developed. Some naturalists, indeed, have preferred to place both this and the following genus with the Climbers, attaching greater weight to the instincts and habits than to the structure, and probably this is the more natural arrangement. The Nuthatches are thick, stoutly built birds, with a straight, pointed or wedge-form bill, with which they probe the fissures of trees, or scale off pieces of the bark to procure the minute insects which are there concealed. While thus engaged, they hop along with great agility and ease on the perpendicular trunk, frequently ascending in a spiral line, till near the top, when they shoot

\* *Tenuis*, slender, and *rostrum*, a beak.

away to the base of another tree, which they ascend as before. The tail is not used to support the body in a perpendicular attitude. The species are usually small, but of untiring activity; possessing great curiosity, exercised, however, with amusing caution, the bird endeavouring to keep the tree between himself and the intruder whom he stretches out his head to reconnoitre. Their voice is loud and startling. The Common Nuthatch of our own country (*Sitta Europæa*) will sufficiently illustrate the genus.

A correspondent of Loudon's Magazine of Natural History has given the following amusing sketch of an individual which fell into his possession: "I had never seen the little bird called the Nuthatch, when one day when I was expecting the transit of some wood-pigeons under a birch tree, with my gun in my hand, I observed a little ash-coloured bird squat himself on one of the large lateral trunks over my head, and, after some observation, begin to tap loudly or rather solidly upon the wood, and then proceed round and round the branch, it being clearly the same thing to him, whether his nadir or zenith were uppermost. I shot, and the bird fell; there was a lofty hedge between us, and when I got over he had removed himself. It was some time before I secured him; and I mention this because the manner in which he eluded me was characteristic of his cunning. He concealed himself in holes at the bottom of a ditch, so long as he heard the noise of motion; and when all was still, he would scud out and attempt to escape. A wing was broken, and I

at length got hold of him. He proved small, but very fierce, and his bite would have made a child cry out. The elbow-joint of his wing being thoroughly shattered, and finding that he had no other wound, I cut off the dangling limb, and put him into a large cage with a common Lark. The wound did not in the least diminish his activity, nor yet his pugnacity, for he instantly began to investigate all means of escape; he tried the bores, then tapped the wood-work of the cage, and produced a knocking sound which made the room re-echo; but after finding his efforts vain, he then turned upon the Lark, ran under him with his gaping beak to bite, and effectually alarmed his far more gentle and elegant antagonist. Compelled to separate them, the Nuthatch, (for this bird I discovered him to be, by turning over the leaves of an Ornithologia,) was put into a smaller cage of plain oak wood and wire. Here he remained all night; and the next morning his knocking or tapping with his beak was the first sound I heard, though sleeping in an apartment divided from the other by a landing-place. He had food given to him, minced chicken and bread-crumbs and water. He ate and drank with a most perfect impudence, and the moment he had satisfied himself, turned again to his work of battering the frame of his cage, the sound from which, both in loudness and prolongation of noise, is only to be compared to the efforts of a fashionable footman upon a fashionable door, in a fashionable square. He had a particular fancy for the extremities of the corner pillars of his cage;

on these he spent his most elaborate taps, and at this moment, though he only occupied the cage a day, the wood is pierced and worn like a piece of old worm-eaten timber. He probably had an idea, that if these main beams could once be penetrated, the rest of the superstructure would fall and free him. Against the doorway he had also a particular spite, and once succeeded in opening it; and when, to interpose a further obstacle, it was tied in a double knot with a string, the perpetual application of his beak quickly unloosed it. In ordinary cages, a circular hole is left in the wire for the bird to insert his head to drink from a glass; to this hole the Nuthatch constantly repaired, not for the purpose of drinking, but to try to push out more than his head, but in vain, for he is a thick bird, and rather heavily built; but the instant he found the hole too small, he would withdraw his head, and begin to dig and hammer at the circle, where it is rooted in the wood, with his pickaxe of a beak, evidently with a design to enlarge the orifice. His labour was incessant, and he ate as largely as he worked; I fear it was the united effects of both that killed him. His hammering was peculiarly laborious, for he did not peck as other birds do, but grasping his hold with his immense feet, he turned upon them as upon a pivot, and struck with the whole weight of his body, thus assuming the appearance, with his entire form, of the head of a hammer; or, as I have sometimes seen birds in mechanical clocks, made to strike the hour by swinging on a wheel. We were in hopes



that when the sun went down he would cease from his labours and rest; but no! at the interval of every ten minutes, up to nine or ten in the night, he resumed his knocking, and strongly reminded us of the coffin-maker's nightly and dreary occupation. It was said by one of us, 'he is nailing his own coffin;' and so it proved. An awful fluttering in the cage, now covered with a handkerchief, announced that something was wrong; and we found him at the bottom of his prison, with his feathers ruffled, and nearly all turned back. He was taken out, and for some time he lingered away in convulsions, and occasional brightenings up. At length he drew his last gasp; and will it be believed, that tears were shed on his demise? The fact is, that the apparent intelligence of his character, the speculation in his eye, the assiduity of his labour, and his most extraordinary fearlessness and familiarity, though coupled with fierceness, gave us a consideration for him that may appear ridiculous to those who have never so nearly observed the ways of an animal as to feel interested in its fate. With us it was different."\*

*Certhia, the Creepers.*

The bill in this genus is curved downwards; and is more slender than in the preceding. The tail is now used as a support in climbing, and to adapt it for this service, the feathers are strong and rigid, and the shafts project in sharp points beyond the webs, as in the Woodpeckers. Of nearly the same

\* Vol. i. p. 328.

habits as the preceding race, the Creepers appear to possess the faculty of climbing in still greater perfection, even to a degree which seems to set the laws of gravitation at defiance. Speaking of a North American species which he considers identical with our little Brown Creeper (*C. Familiaris*), Wilson says, —“The Brown Creeper is an extremely active and restless little bird. In winter it associates with the small spotted Woodpecker, Nuthatch, Titmouse, &c.; and often follows in their rear, gleaning up those insects which their more powerful bills had alarmed and exposed; for its own slender incurvated bill seems unequal to the task of penetrating into even the decayed wood; though it may enter into holes, and behind scales of the bark. As the party advances through the woods from tree to tree, our little gleaner seems to observe a good deal of regularity in his proceedings; for I have almost always observed, that he alights on the body near the root of the tree, and directs his course, with great nimbleness, upwards to the higher branches, sometimes spirally, often in a direct line, moving rapidly and uniformly along, with his tail bent to the tree, and not in the hopping manner of the Woodpecker, whom he far surpasses in dexterity of climbing, running along the lower side of the horizontal branches with surprising ease. If any person be near when he alights, he is sure to keep the opposite side of the tree, moving round as *he* moves, so as to prevent him from getting more than a transient glimpse of him. The best method of outwitting him if you are alone, is, as soon as he

alights and disappears behind the trunk, to take your stand behind an adjoining one, and keep a sharp look out twenty or thirty feet up the body of the tree he is upon,—for he generally mounts very regularly to a considerable height, examining the whole way as he advances. In a minute or two, hearing all still, he will make his appearance on one side or other of the tree, and give you an opportunity of observing him.”\*

*Cinnyris,† the Sunbirds.*

These minute but brilliant little birds, shining in the most resplendent plumage, represent, together with the Honeysuckers, (*Meliphaga*,‡) the Humming-birds in the tropical regions of the old world. They are found in Africa and the Isles of India in the greatest abundance, whence they are frequently brought to Europe, and are the ornament of our museums. They are closely allied to the Creepers in form, and are often called by the same name; it would appear that they retain somewhat of their habits also, for though the tongue is tubular, and the food consists principally of the honey contained in deep flowers, they are said to feed not upon the wing, as the Humming-birds do, but adhering by their feet to the perpendicular stalks of the shrubs and flowers. They thus shew a beautiful transition between these two genera. The tongue of the Honeysuckers terminates in a branch

\* Am. Orn. vol. ii. p. 196. [Constable's Ed.]

† The Greek name of a small bird unknown.

‡ Μέλι, *meli*, honey, φάγω, *phago*, to eat.

of bristles, which, like a brush, licks up the nectar. In them as well as in the Sunbirds, it is capable of being protruded to some distance from the bill.

*Trochilus,\* the Humming-bird.*



HUMMING-BIRDS (*Trochilus Cornutus*, *T. Sparganurus*, and *T. Ornatus*).

Among the gorgeous treasures which the adventurous Genoese laid open to the view of astonished Europe, by his discovery of the new world, perhaps the most splendidly beautiful, and engagingly at-

\* Τρόχιλος, *trochilos*, a wren.

tractive, though the most diminutive, were the countless hosts of Humming-birds, which, thronging the air, make a western landscape alive with their radiance. No wonder that the early Spanish writers should speak in lavish eulogy of their beauty, since even the apathetic Indians, though familiar with them all their lives, could not avoid involuntary homage to their loveliness, calling them by the names of gems, stars, and sunbeams. And all succeeding visitors to those shores, though perhaps but little observant of nature, have been struck with unfailing admiration at the sight of these living meteors; while the naturalist, in his delighted enthusiasm, labours in vain for words to draw the picture which he beholds. Mr. Swainson justly remarks,—“ In speaking of these charming birds, the naturalist is almost tempted to abandon that didactic style best suited to his subject, and to clothe his information in the language of poetry; yet both must fail in conveying to the mind an adequate idea of their surpassing beauty. The rainbow colours of the most resplendent gems are here superadded to a living form, which in itself is exquisitely graceful and animated in all its movements: the flight of these pigmy birds is so rapid as to elude the eye; for a few moments they may be seen hovering over a flower, but so soon as they have sipped its sweetness, they vanish in an instant.”\*

They are the smallest of birds, many of them being less than a man's thumb, while one tiny crea-

\* Nat. Hist. and Class. of Birds, vol. ii. p. 147.

ture (*T. Minimus*) is no larger than a bee. A few, however, are of comparatively large dimensions, the largest of all being nearly equal in size to the common Swift (*Hirundo Apus*). They have a long and very slender bill, enclosing a tongue usually described as tubular, composed of two parallel filaments used in sucking (or licking) the nectar from the tubes of flowers. They eat minute insects also, which they capture both on the wing, and within flowers; and it is probable that these, after all, form the principal part of their nutrition. Their feet are very small and slight, shewing that they perch but little, but their excessively long and powerful, though narrow wings, their broad tail, and their largely developed breastbone (*sternum*), render them, perhaps, the most perfectly aerial of all the feathered tribes. “The flight of the Humming-bird is like that of no other bird; it has a character peculiarly its own. When most birds fly, we perceive there is an evident effort; that constant exertion, more or less, is necessary to support them in the air; their tendency appears to be to sink, which has to be constantly resisted by muscular effort. The Swallows, and some other tribes of swift and powerful flight, appear to skim at will through any stratum of the atmosphere without any *tendency* to rise or sink; but the Humming-bird seems just like a cork drawn under water; he seems all *buoyancy*, as if his natural place were above the clouds, and he had to struggle to keep himself in the lower air; he brings himself down to suck the flowers, then shoots away with a springy



lightness like an unencumbered balloon, when the cords are cut. It is more like the flight of a dragon-fly than anything else, but much more buoyant."

The Humming-birds, of which more than a hundred species are already known, are confined to the western hemisphere, and chiefly to the sunny isles of the West Indies, and the tropical regions of South America, where they may be seen at all hours of the day, darting in arrowy flight like shooting stars, or suddenly arresting their course to poise themselves in front of some deep flower, their wings only appearing as a little cloud, from the rapidity of their vibration, and the long tongue protruded and probing to the very bottom, or if the flower be large, as the great Bignonias and Ipomeas, the whole head is fearlessly inserted. The writer of this work has often been struck with the strong resemblance which their manners bear to those of the great Hawkmoths, borne out also by the loud hum which each makes in the swift vibration of the wings. They are fearless and familiar in their habits, and are easily reconciled to confinement; numerous instances are recorded of their having been kept in captivity in their own region: and in one solitary case they have been brought to England. A female (*T. Mango*), with the nest and eggs, was put on board ship, where the young were hatched. The mother soon died, but the young were brought to England, and were some time in the possession of Lady Hammond. Both of them died, however, in a few weeks. At a meeting of the Zoological

Society, May 13, 1834, "A note was read from Mrs. Barnes, in which it was stated, that that lady had brought up from the nest two of the smallest species of Jamaica Humming-birds. They were so tame, that at a call they would fly to her and perch upon her finger. Their food was sugar and water. During the passage to England one of them was killed by the cage in which they were kept being thrown down in a storm; its companion drooped immediately, and died shortly afterwards."\* They are not at all difficult to procure; the writer has captured the Ruby-throat in North America with the greatest facility by means of a common butterfly ring-net. Our acquaintance with the native habits of these fairy creatures is chiefly derived from Wilson's and Audubon's vivid accounts of the North American species, the Ruby-throat (*T. Colubris*), and Bullock's notices of a few West Indian and Mexican kinds. They appear in general much to resemble each other, but the mode of hunting adopted by one, the Mexican Star, (*T. Cyanopogon*,†) is so curious, that we cannot refrain from quoting it as detailed by Mr. Bullock: "The house I resided in at Xalapa for several weeks, on my return to Vera Cruz, was only one story high, enclosing, like most of the Spanish houses, a small garden in the centre, the roof projecting six or seven feet from the walls, covering a walk all round, and leaving a small space only between the tiles and the trees which grew

\* Proceedings, 1834, p. 33.

† *Kυανός*, *kyanos*, blue, and *πώγων*, *pogon*, the beard.

in the centre. From the edges of these tiles to the branches of the trees in the garden, the spiders had spread their innumerable webs so closely and compactly, that they resembled a net. I have frequently watched, with much amusement, the cautious peregrinations of the Humming-bird, who, advancing beneath the web, entered the various labyrinths and cells in search of entangled flies; but as the larger spiders did not tamely surrender their booty, the invader was often compelled to retreat. Being within a few feet, I could observe all their evolutions with great precision. The active little bird generally passed once or twice round the court, as if to reconnoitre his ground, and commenced his attack by going carefully under the nets of the wily insect, and seizing by surprise the smallest entangled flies, or those that were most feeble. In ascending the angular traps of the spider great care and skill were required; sometimes he had scarcely room for his little wings to perform their office, and the least deviation would have entangled him in the complex machinery of the web, and involved him in ruin. It was only the works of the smallest spider that he durst attack, as the largest rose to the defence of their citadels, when the besieger would shoot off like a sunbeam, and could only be traced by the luminous glow of his refulgent colours. The bird generally spent about ten minutes in this predatory excursion, and then alighted on the branch of an *avocata* to rest and refresh himself, placing his crimson star-like breast to the sun, which then presented

all the glowing fire of the ruby, and surpassed in lustre the diadem of monarchs.”\*

The cause of these brilliant gem-like reflections of colour, changing in different lights to the most opposite hues, is not well understood; they seem, however, to depend upon a peculiar structure in the close, scale-like feathers with which these birds are clothed, and are usually seen in the highest perfection on the throat and crest. Much of their living radiance is lost to us, who see them only fastened to a wire in a glass case. In some species the tail is greatly developed and forked, as in *T. Cora*,† *T. Cornutus*, and especially *T. Sparganurus*,‡ while in others, as *T. Ornatus*, *T. Audenetii*, and *T. Magnificus*, the neck is adorned with narrow, slender feathers, which project or radiate horizontally. The species with which we are acquainted usually lay two eggs, deposited in a nest composed, of course, of various materials, and differing in form, but usually very warmly lined with down of plants. The Ruby-throat, (*T. Colubris*,) sits ten days; others more, perhaps some less.

We shall close our notice of this beautiful tribe with the following lines, from the enthusiastic Wilson :—

“ When morning dawns, and the blest sun again  
Lifts his red glories from the eastern main,

\* Six Months in Mexico, p. 270.

† *Κωρα*, *kora*, a fair damsel.

‡ *Σπάργανον*, *sparganon*, a bandage, and *οὐρά*, *oura*, the tail.

Then through our woodbines, wet with glittering dews,  
 The flower-fed humming bird his round pursues ;  
 Sips, with inserted tube, the honey'd blooms,  
 And chirps his gratitude, as round he roams ;  
 While richest roses, though in crimson drest,  
 Shrink from the splendour of his gorgeous breast :  
 What heavenly tints in mingling radiance fly !  
 Each rapid movement gives a different dye ;  
 Like scales of burnish'd gold they dazzling show,  
 Now sink to shade,—now like a furnace glow.”\*

We cannot pause to notice the Hoopoes, (*Upupa*, †) nor the splendid birds belonging to the genera *Epinachus* ‡ and *Ptiloris*, § which form the connecting link between the *Tenuirostres* and the Birds of Paradise : to these they bear so strong a resemblance, especially in their long shaft-feathers, and metallic tints, as to have been formerly placed in the same genus.

#### FAM. IV.—FISSIROSTRES.||

THIS is a small, yet a natural and strongly marked division, consisting of two great genera, the Nightjars and the Swallows. The beak is broad at the base, short, hooked at the tips, and opening with a very wide gape. They feed on insects on the wing, being the most expert of fly-catchers, to capture which they are endowed with great power and velocity of flight.

\* Am. Orn., vol. ii. p. 209.

† The ancient Latin name.

‡ Ἐπίμαχος, *epimachos*, quarrelsome.

§ Πτίλον, *ptilon*, a feather.

|| *Fissus*, cleft, and *rostrum*, a beak.

*Caprimulgus,\* the Nightjar.*

It is much to be regretted that scientific naturalists should, in their systematic names, perpetuate the groundless and ridiculous prejudices too often entertained by the vulgar; as in the name of this genus, of which the common appellation, “Goat-



THE NIGHT-JAR (*Caprimulgus Europæus*).

sucker,” is a translation. It is superfluous to say, that the act which has given such a name is utterly impossible to be performed, and the notion most absurd. Either of the names, Nightjar, or Fern Owl, is far preferable, the former because it is highly expressive of a singular habit, as well as of the

\* *Capra*, a goat, and *mulgeo*, to milk.



season of its activity, and the latter because (in part at least) it marks its resemblance to the true Owls, to which its affinity is shewn in its general form, its beak, its nocturnal habits, its usual colours, and even in some of its manners.

The Nightjars feed on large moths and beetles, flying in the air, to secure which the mouth is furnished with stiff bristles or moustaches. They fly chiefly at morning and evening twilight, but some remain abroad during the whole night. The Whip-poor-will, (*C. Vociferus*), and the Chuck-will's-widow, (*C. Carolinensis*), of North America, are celebrated for their singular cries, resembling respectively these articulate sounds, and the Night-hawk, (*C. Americanus*), for the hollow booming sound which it utters, as it drops perpendicularly from a great height. These are all well described by Wilson and Audubon, and our illustrious Gilbert White gives some interesting particulars of the English species, (*C. Europæus*.) He says,—"There is no bird, I believe, whose manners I have studied more than those of the *Caprimulgus*, as it is a wonderful and curious creature; but I have always found, that, though sometimes it may chatter as it flies, as I know it does, yet, in general, it utters its jarring note sitting on a bough; and I have for many a half-hour watched it as it sat with its under mandible quivering, and particularly this summer. It perches usually on a bare twig, with its head lower than its tail. This bird is most punctual in beginning its song exactly at the close of day, so exactly, that I have known

it strike up more than once or twice, just at the report of the Portsmouth evening gun. It appears to me past all doubt, that its notes are formed by organic impulse, by the powers of the parts of its windpipe formed for sound, just as cats purr. You will credit me, I hope, when I assure you that, as my neighbours were assembled in a hermitage on the side of a steep hill, where we drank tea, one of these Churn Owls came and settled on the cross of that little straw edifice, and began to chatter, and continued his note for many minutes; and we were all struck with wonder to find that the organs of that little animal, when put in motion, gave a sensible vibration to the whole building! This bird, also, sometimes makes a small squeak, repeated four or five times, and I have observed that to happen when the cock has been pursuing the hen in a toying manner through the boughs of a tree.”\* Again, he observes,—“On the twelfth of July, I had a fair opportunity of contemplating the motions of the *Caprimulgus*, or Fern Owl, as it was playing round a large oak that swarmed with fern chafers. The powers of its wing were wonderful, exceeding, if possible, the various evolutions and quick turns of the Swallow genus. But the circumstance that pleased me most was, that I saw it distinctly, more than once, put out its short leg, while on the wing, and, by a bend of the head, deliver somewhat into its mouth. If it takes any part of its prey with its foot, as I have now the greatest reason to sup-

\* Nat. Hist. Selborne, Jenyns' Edit., p. 87.

pose it does these chafers, I no longer wonder at the use of its middle toe, which is curiously furnished with a serrated claw.”\*

The species are scattered all over the world, and Africa produces, among others, one (*C. Longipennis*) with a curious feather proceeding from each wing, twice the length of the body; it is bearded only at the tip. The whole tribe have the habit of perching lengthwise on a branch, and not across it.

*Hirundo,† the Swallow.*

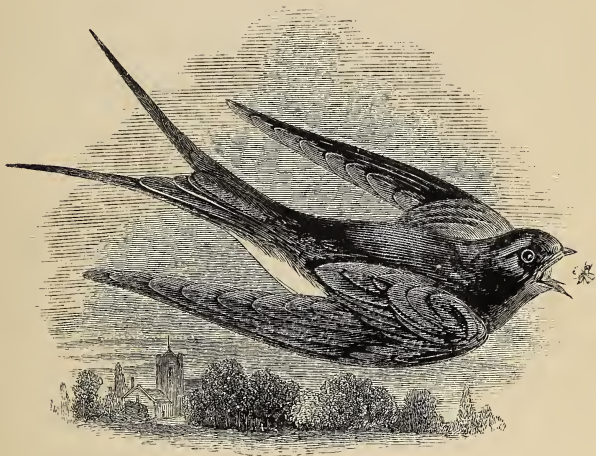
The whole structure of the Swallows shews that the air is their home: the body is long and taper, the plumage close and dense, the feet exceedingly small, the tail forked, the sternum large, and the wings enormous. The Swifts (*Cypselus*) perform nearly all the functions of life on the wing,‡ except sleeping and incubation, and when they rest it is against the perpendicular face of a rock or wall,

\* Nat. Hist. Selborne, Jenyns' Edit., p. 129.

† Its Latin name.

‡ The following very curious and interesting fact, which was communicated to us by the observer himself, seems to indicate that the Swallows are unable (perhaps from the extreme smallness and weakness of their bill) to capture prey in any other situation than the air. A few years ago, a gentleman, while walking in his garden at Wareham, in Dorsetshire, observed a Swallow suddenly alight on a broad gravelled walk a few yards from his feet. Struck with the singularity of the bird's position and attitude, he observed it more narrowly, and discovered a fly settled on the walk, in close proximity to the bird, which was evidently watching it. Both remained motionless for about a minute, when the fly rose into the air, and the Swallow instantly opening its mouth, sprung up also, and seizing it in a moment, pursued its course.

to which their four toes, all pointing forward, enable them to cling. Our common Swift, (*C. Apus*,) the largest of the English species, continues with us a very short season, coming the latest, and retiring the earliest. It builds in crevices of towers and steeples, and under the edge of very lofty roofs, where it lays two eggs. Other species build in concealment, as the Chimney Swallow, (*H. Rustica*,)



THE CHIMNEY SWALLOW (*Hirundo Rustica*).

and the Sand Martin, (*H. Riparia*,) while the House Martin, (*H. Urbica*,) constructs an ingenious semi-globular nest of mud beneath the eaves of houses, even in the midst of our crowded streets. White's monographs of these four species, (Letters XVI. XVIII. XIX. XX. and XXI., second series,) are highly inter-

esting and beautiful models for the naturalist. The nests of (as it would appear) several species, in the extreme east of Asia, are much valued as an esculent delicacy. Swallows are found in all countries.

FAM. V.—SYNDACTYLI.\*

IN this family the genera have little in common as respects the bill, but they agree in having the outer toe united to the middle one, as far as the second joint. Some naturalists reject this division, and distribute the birds into other families and orders.

*Merops*,† *the Bee-eater*.

These, having long wings and small feet, and pursuing their insect prey through the air, have some affinity to the Swallows, but the beak is long, slender, curved, and pointed. They chiefly prey on the stinging Hymenopterous insects, such as bees, hornets, &c., but it is remarkable that they are never stung. They are confined to the warm climates of the Old World, but a single species, (*M. Apiaster*,) occasionally visits Britain. They are generally birds of beautiful plumage, adorned with brilliant metallic tints and gay colours.

\* Συν, *syn*, together, and δάκτυλος, *daktylos*, a toe.

† Its ancient Greek and Latin name.

*Alcedo,\* the Kingfisher.*

The head thick, the body short and squat, the feet disproportionately small, the tail short, and the bill enormously large, the Kingfishers prove how little brilliance of tints can atone for ugliness of form. Many of them are almost hideous, notwithstanding the bright colours, chiefly shades of blue and green, with which they are arrayed. Yet they are not the less beautifully adapted to their condition; their organization is as perfect, and their instincts as unerring, as those of the most favoured. They live exclusively on fish; sitting patiently on some low branch that overhangs the water, they wait till some unfortunate fish passes beneath; down they drop upon their prey, and sweeping it up instantly swallow it, without picking the bones. Their voices are harsh, loud, and sudden. They lay in holes in cliffs, generally near the water, and are inhabitants of all parts of the world. England possesses one, (*A. Isipida*,) of somewhat small size, with the bill less disproportioned than in some of the foreign species.

*Buceros,† the Hornbill.*

The inflated bills of the last genus in some measure prepare us for the singular form of that organ in the present. The Hornbills are birds of sombre

\* Perhaps from ἅλς, *hals*, the sea, and δίδωμι, *didomi*, to give, because of the ancient fabulous stories of their calming the sea for mariners.

† Βούς, *bous*, an ox, and κέρας, *keras*, a horn.



THE HORNBILL (*Buceros Cavatus*).

plumage and large size, having an enormous bill usually furnished at the base with excrescences, more or less resembling horns ; in some, the projection is scarcely less than the rest of the bill. The use of this singular structure is not ascertained. They inhabit India and Africa, where they are said to eat fruits, and to hunt for small birds, mice, and reptiles ; some, according to M. Le Vaillant, even devour carrion. They are noisy, and associate in flocks, and are reported to have the habit of tossing their prey into the air and catching it again before it is devoured.



THE IVORY-BILLED WOODPECKER (*Picus Principalis*), and the  
RESPLENDENT TROGON (*Trogon Resplendens*).

ORDER III. SCANSORES.\*

The birds composing this order are associated from the common property of having the toes arranged in pairs, two pointing forward and two backward: in other words, the outer toe points in the

\* *Scando*, to climb.

same direction as the thumb. This conformation enables some of the genera to climb the perpendicular trunks of trees, which has given a name to the order, derived from partial grounds; for whereas, as we have seen, some of the *Tenuirostres* climb in great perfection, some of the *Scansores* do not climb at all, as the Trogons and Cuckoos. They feed for the most part on fruits, or insects, according to the firmness of the bill; some appear even to prey on small vertebrate animals. They are forest birds, usually building their nests in hollow trees. Generally speaking, they are birds of considerable size, and adorned with brilliant and, in some instances, metallic colours.

*Picus,\* the Woodpecker.*

No birds are better qualified to display “the wisdom of God in the works of creation,” than these. Every part of their structure (and it is rather a singular one) points to a single instinct, and is admirably adapted for it. The food of the Woodpeckers consists almost exclusively of insects, which dwell safe from all other assailants in the solid wood of trees. To obtain these, many contrivances are necessary, many deviations from the form of other birds. The large and strong toes arranged in pairs give them great power of maintaining their footing on a perpendicular surface, and the body is additionally supported by the stiff and horny tail, composed of strong feathers ending in sharp points,

\* Its ancient Latin name.

which being thrown in against the tree acts as a prop. The bird is thus brought to the scene of operations, where, instructed probably by the sense of hearing of the presence of his prey, he has to dig it out. For this purpose, a beak is given him shaped like a wedge, almost as strong and hard as steel, terminating in a fine edge like a chisel. With this efficient instrument, moved by the powerful muscles of the neck, he taps the tree in rapid succession,—in an astonishingly short time chisels a hole, and lays bare the insidious grub. But this is not all; the worm must be extracted, as well as exposed: and here another beautiful piece of mechanism is seen. The tongue, by means of a slender elastic bone passing round the back of the head, can be projected far out of the beak: it terminates in a horny point, furnished with little barbs pointing backwards, and is covered moreover with a thick glutinous secretion.

The species, which are numerous, are scattered over both continents; six or seven are European, of which one (*P. Viridis*) is beautifully coloured with green, spotted with white, and marked on the head with red. The most usual colours are glossy black and white arranged in various patterns; the head, and sometimes other parts, are marked in very many species with vivid crimson or scarlet.

At the head of the genus may be placed the noble Ivory-billed Woodpecker, (*P. Principalis*), so called from the colour and consistence of his polished beak. Wilson says of him,—“He may be called the king

or chief of his tribe, and nature seems to have designed him a distinguished characteristic in the superb carmine crest, and bill of polished ivory with which she has ornamented him. His eye is brilliant and daring; and his whole frame so admirably adapted for his mode of life and method of procuring subsistence, as to impress on the mind of the examiner the most reverential ideas of the Creator. His manners have also a dignity in them superior to the common herd of Woodpeckers. Trees, shrubbery, orchards, rails, fence-posts, and old prostrate logs are alike interesting to those, in their humble and indefatigable search for prey: but the royal hunter now before us scorns the humility of such situations, and seeks the most towering trees of the forest, seeming particularly attached to those prodigious cypress swamps, whose crowded giant sons stretch their bare and blasted or moss-hung arms midway to the skies. In these almost inaccessible recesses, amid ruinous piles of impending timber, his trumpet-like note and loud strokes resound through the solitary savage wilds, of which he seems the sole lord and inhabitant. Wherever he frequents, he leaves numerous monuments of his industry behind him. We there see enormous pine-trees, with cart-loads of bark lying around their roots, and chips of the trunk itself in such quantities as to suggest the idea that half-a-dozen of axe-men had been at work there the whole morning. The body of the tree is also disfigured with so numerous and so large excavations, that one can



hardly conceive it possible for the whole to be the work of a Woodpecker."

"The first place I observed this bird at, on my way to the South, was about twelve miles north of Wilmington in North Carolina. Having wounded it slightly in the wing, on being caught it uttered a loudly-reiterated and most piteous note, exactly resembling the violent crying of a young child, which terrified my horse so as nearly to have cost me my life: it was distressing to hear it. I carried it with me in the chair under cover to Wilmington. In passing through the streets, its affecting cries surprised every one within hearing, particularly the females, who hurried to the doors and windows with looks of alarm and anxiety. . . . I took him up stairs, and locked him up in my room, while I went to see my horse taken care of. In less than an hour I returned; and on opening the door he set up the same distressing shout, which now appeared to proceed from grief that he had been discovered in his attempts at escape. He had mounted along the sides of the window, nearly as high as the ceiling, a little below which he had begun to break through. The bed was covered with large pieces of plaster; the lath was exposed for at least fifteen inches square, and a hole, large enough to admit the fist, opened to the weather-boards; so that, in less than another hour, he would certainly have succeeded in making his way through. I now tied a string round his leg, and fastening it to the table again left him. I wished to preserve his life, and had gone off in



search of suitable food for him. As I re-ascended the stairs, I heard him again hard at work, and on entering had the mortification to perceive that he had almost entirely ruined the mahogany table to which he was fastened, and on which he had wreaked his whole vengeance. While engaged in taking a drawing, he cut me severely in several places; and, on the whole, displayed such a noble and unconquerable spirit, that I was frequently tempted to restore him to his native woods. He lived with me nearly three days, but refused all sustenance, and I witnessed his death with regret.”\*

The manners of all are pretty much the same, down to the diminutive Downy Woodpecker, no larger than a Sparrow, (*P. Pubescens*), of which the engaging writer just quoted observes,—“The principal characteristics of this little bird are diligence, familiarity, perseverance, and a strength and energy in the head and muscles of the neck which are truly astonishing. Mounted on the infected branch of an old apple-tree, where insects have lodged their corroding and destructive brood in crevices between the bark and wood, he labours sometimes for half an hour incessantly at the same spot, before he has succeeded in dislodging and destroying them. At these times you may walk up pretty close to the tree, and even stand immediately below it, within five or six feet of the bird, without in the least embarrassing him. The strokes of his bill are distinctly heard several hundred yards off; and I have known him to be at work for two hours together

\* Am. Orn. vol. i. p. 132.

on the same tree. Buffon calls this 'incessant toil and slavery;' their attitude 'a painful posture;' and their life 'a dull insipid existence,' expressions improper, because untrue; and absurd, because contradictory. The posture is that for which the whole organization of his frame is particularly adapted: and though to a wren or a humming-bird the labour would be both toil and slavery, yet to him it is, I am convinced, as pleasant and as amusing as the sports of the chase to the hunter, or the sucking of flowers to the humming-bird. The eagerness with which he traverses the upper and lower sides of the branches, the cheerfulness of his cry, and the liveliness of his motions, while digging into the tree and dislodging the vermin, justify this belief."\*

Much resembling the Woodpeckers in structure, but differing in its tail, which is not used as a prop, a pretty little bird is a summer visitant of our own country, the Wryneck (*Yunx*† *Torquilla*). It does not, however, often climb, but devotes its attention to the depopulation of ant-hills on the ground. It is marked with minute streaks of black and fawn-colour, and has a habit when startled of twisting round its head: it builds, like the former, in holes in rotten trees.

*Cuculus*,‡ *the Cuckoos*.

The Cuckoos appear at first sight to bear but little affinity to the Woodpeckers, except in the

\* Am. Orn. vol. i. p. 163.

† Ἰύνξ, *iünx*, the Greek name of this bird.

‡ Their Latin name.

arrangement of the toes, and even this is partial, as the outer toe is capable of being brought half round. Yet there is a bird, the Gold-winged Woodpecker, (*P. Auratus*,) which forms the connecting link between the two genera, and was actually placed by Linnæus in this genus. The beak of the Cuckoos is arched, and flattened sidewise; the tail is long, and not used for climbing; the feet, notwithstanding their form, are used for perching alone. They feed on insects, and in temperate countries are birds of passage, but they are diffused over both continents. They (at least the true Cuckoos) are remarkable for the inexplicable instinct which prompts the female to deposit her eggs, singly, in the nests of other insect-eating birds, much smaller than herself, by whom the surreptitious offspring is reared at the expense of the rightful family. Our own species, (*C. Canorus*,) whose voice, so delightfully associated with joyous summer, is well known, selects for this office the Hedge-sparrow, Titlark, Redbreast, Nightingale, and such like birds. There is reason to believe that the egg is first laid, and carried to the nest in the mouth of the mother. The habit, strange as it is, is not confined to the Cuckoos; for, besides the various African species, there is an American bird of a widely-different genus, the Cow-bunting, (*Icterus*\* *Pecoris*,) a species of Starling, which has just the same propensity.

Through the Honey-guides, (*Indicator*,†) the Barbets, (*Bucco*,) and a few other forms, we come to the genus Trogon.

\* The Greek name of some bird.

† *Indico* to point out.

*Trogon*,\*

a splendid tribe from the tropical regions of America, Africa, and Asia. Their plumage is often adorned with resplendent metallic hues, and the tail is much lengthened. "They are not climbing birds, nor are they in the least organized for that purpose; they live in the deepest and most gloomy shades during day, where they sit almost motionless on a dead branch. During the morning and evening they are more active; at these times they go into the open parts of the forest, and, taking a shady station, dart upon winged insects, particularly hard-coated beetles; at other times they feed upon fruits, especially on the rich purple berries of the different *Melastomæ*, at which they invariably dart, precisely the same as if they were insects capable of getting away."† Mr. Swainson traces in several particulars a very curious affinity between these birds and the Nightjars, placing them in the *Fissirostres*.

*Rhamphastos*,‡ the Toucan.

In the enormous beak of these birds, in their large size, and in the prevalence of black in their plumage, we are reminded of the Hornbills, (*Buceros*,) to which indeed they shew a near relation in manners and food, and which they appear to replace in the tropical parts of South America.

\* Τρυγών, *trygon*, the Greek name of the Pigeons.

† Swainson,—“Birds,” in Cab. Cyc. vol. ii. p. 155.

‡ Ράμφος, *rhamphos*, a beak.

In some of the species the beak attains a size nearly equal to that of the whole body; and, were its density equal to that of other birds' bills, its weight would be insupportable: but it is exceedingly light, being full of cells, formed of very thin plates of porous bone, and covered with a horny coat, which in life reflects brilliant prismatic colours. The edges are cut into sharp teeth, and the tongue is furnished with horny fibres pointing outwards, so as to resemble the beards of a feather. The feet are fitted for grasping firmly, but not for climbing, to which these birds are not addicted. They appear to feed on the eggs and young of birds, and occasionally on small mammals and reptiles, in search of which they hop about with considerable activity.

Their prevailing colours are black above, and various brilliant tints of red and yellow on the under parts. Some of them, however, marked by a smaller beak, have the upper parts green instead of black.

Mr. Broderip, in the *Zoological Journal*, has recorded some observations on the Red-beaked Toucan, (*R. Erythrorhynchus*,\*) which are highly interesting. The individual in question had appeared greatly excited at the sight of a young Canary which was near its cage, and on being liberated instantly devoured it. Mr. Broderip being desirous to witness such an occurrence, the proprietor of the bird presented it with a Goldfinch in his presence.

\* 'Ερυθρός, *erythros*, red, and ῥύνχος, *rhynchos*, the beak.

“The instant he introduced his hand with the Goldfinch into the cage of the Toucan, the latter, which was on a perch, snatched it with his bill. The poor little bird had only time to utter a short weak cry; for within a second it was dead, killed by compression on the sternum and abdomen, and that so powerful, that the bowels protruded after a very few squeezes of the Toucan’s bill. As soon as the Goldfinch was dead, the Toucan hopped with it still in his bill to another perch, and, placing it between his right foot and the perch, began to strip off the feathers with his bill. When he had plucked away most of them, he broke the bones of the wings and legs (still holding the little bird in the same position) with his bill, taking the limbs therein, and giving at the same time a strong lateral wrench. He continued this work with great dexterity till he had almost reduced the bird to a shapeless mass; and ever and anon he would take his prey from the perch in his bill, and hop from perch to perch, making at the same time a peculiar hollow clattering noise, at which times I observed that his bill and wings were affected with a vibratory or shivering motion, though the latter were not expanded. He would then return the bird to the perch with his bill, and set his foot on it. He first ate the viscera, and continued pulling off and swallowing piece after piece, till the head, neck, and part of the back and sternum with their soft parts were alone left: these, after a little more wrenching while they were held on the perch, and mastication, as it were, while



they were held in the bill, he at last swallowed, not even leaving the beak or legs of his prey. The last part gave him the most trouble, but it was clear to me that he felt great enjoyment; for whenever he raised his prey from the perch, he appeared to exult, now masticating the morsel with his toothed bill and applying his tongue to it, now attempting to gorge it, and now making the peculiar clattering noise, accompanied by the shivering motion above mentioned. The whole operation, from the time of seizing his prey to that of devouring the last morsel, lasted about a quarter of an hour. He then cleaned his bill from the feathers by rubbing it against the perches and bars of his cage. While on this part of the subject, it may be as well to mention another fact, which appears to me not unworthy of notice. I have more than once seen him return his food, after he had taken it, from his crop, and after masticating the morsel awhile in his bill, again swallow it: the whole operation, particularly the return of the food to the bill, bearing a strong resemblance to the analogous action in the ruminating animals. The food on which I saw him so employed was a piece of beef, which had evidently been macerated some time in the crop. While masticating it, he made the same hollow clattering noise as he made over the remains of the Goldfinch. Previous to this operation he had examined his feeding trough, in which there was nothing but bread, which I saw him take up and reject; and it appeared to me that he was thus re-

duced from necessity to the above mode of solacing his palate with animal food. His food consists of bread, boiled vegetables, eggs, and flesh, to which a little bird is now added, about every second or third day. He shews a decided preference for animal food, picking out all morsels of that description, and not resorting to the vegetable diet till all of the former is exhausted.”\*

The figure which the Toucan presents when at roost is not a little ludicrous, at least if we may judge from the habits of a specimen (*R. Ariel*) in the possession of the Zoological Society, described by Mr. Bennett. “When moderately free from interruption, its habits are singularly regular. At the approach of dusk, it finishes its last meal for the day, takes a few turns round the perches of its cage, and then settles on the highest of them. The moment it alights on the perch, its head is drawn in between its shoulders, and its tail turned vertically over its back. In this posture it generally continues for about two hours, between sleeping and waking, its eyes for the most part closed, but opening on the slightest interruption. At such times it allows itself to be handled, and will even take any favourite food that is offered to it, without altering its position further than by a gentle turn of the head. It will also suffer its tail to be replaced in its natural downward posture, but immediately returns it, as if by a spring, to the vertical position. At the end of about two hours it begins

\* Zool. Jour. vol. i. p. 487.

gradually to turn its bill over its right shoulder, and to nestle it among the feathers of its back, sometimes concealing it completely within the plumage, at other times leaving a slight portion of its upper edge exposed. At the same time it droops the feathers of its wings and those of the thigh coverts, so as to encompass the legs and feet; and thus, nearly assuming the appearance of an oval ball of feathers, secures itself against all exposure to cold.”\*

*Psittacus,† the Parrots.*

From their bright and showy plumage, their familiarity and docility, their faculty of closely imitating articulate sounds, and the facility with which they are kept in confinement, the Parrots have always been general favourites. “In their characters, physical and moral, and in the peculiar mode of existence resulting therefrom, in the situations which they frequent, and in the occupations which they pursue,” as well as in their imitative powers, their odd gesticulations and grimaces, and their loud and harsh voices, they have generally been considered as the representatives in their own class of the Apes and Monkeys among Mammalia.

The genus (or rather family) though a very extensive, is also a very natural, one; any species is easily recognised as a Parrot at first sight, even by an unscientific observer: the short and stout

\* Gardens and Menag. vol. ii. p. 79.

† Their ancient Greek name.

legs, the thick and scaly toes, arranged in pairs, the strongly curved claws, the round fleshy tongue, and above all the large, round, hooked beak, need not the more obvious character of colour at once to discover its relation. They abound in both hemispheres, but scarcely pass the limits of the tropical regions.

Notwithstanding their great general similarity, there are, however, sufficient differences of form among the species to enable naturalists readily to group them in sub-genera. The chief of these are the Macaws, (*Macrocerus*,\*) including the Parroquets, distinguished by their long tails and the extremely hooked form of their bills; the Parrots, (*Psittacus*,) with short even tails; the Cockatoos, (*Ptyctolophus*,†) with a folding crest, broad tail, and a plumage in general more or less white; the Lories, (*Lorius*,‡) with a bill less curved, a wedge-form tail, and a plumage whose ground-colour is scarlet, brilliantly contrasted, however, with other colours; and the Broad-tails, (*Platycercus*,§) including the lovely Ground Parroquets of New Holland, distinguished by the great length and width of the tail and the comparative slenderness of the feet.

The species which, of the whole tribe, is the most remarkable for its aptitude at learning the sounds of human language, is the common Grey

\* Μακρός, *makros*, long, and κέρκος, *kerkos*, a tail.

† Πλύσσω, *plysso*, to fold, and λόφος, *lophos*, a crest.

‡ Lory, from their cry.

§ Πλατύς, *platys*, broad, and κέρκος, *kerkos*, a tail.



ROSE-CRESTED COCKATOO (*Ptilinopus leadbetteri*), and TOURACO (*Corythaix persa*).

Parrot, (*Psittacus Erythacus*,)\* a native of Western Africa, belonging to the second of the above divisions. An unceasing chatterbox, it seems to delight in displaying its powers of eloquence, which,

\* Probably from Erythea, an island on the coast of Africa.

indeed, in the variety of its tones, the distinctness of its articulation, and the precision of its imitation, are of a surprising character. We need not, however, assure our readers, that all the marvellous tales which have been repeated of its ability to carry on an intelligent conversation are either entirely fabulous or gross exaggerations. The whole tribe is believed to attain a great age; one of the present species is mentioned by Le Vaillant as having lived in captivity ninety-three years. They feed exclusively on fruits, and associate in large flocks, which are described by those who have seen them in their flights,—their beautiful plumage shining in the rays of a tropical sun,—as a most superb and magnificent sight. On the trees, they climb about the branches, assisted by the bill as if it were a hand, and suspending themselves in various attitudes, with an ease and native grace never exhibited in the confinement of a cage. The menagerie of the Zoological Society is peculiarly rich in this splendid and noble family.

*Corythaix,\* the Touraco.*

A beautiful bird of South Africa, whose rich green plumage is varied on the wings by brilliant crimson: it feeds on soft fruits.

\* Κόρυς, *korys*, a helmet. ῥοιζάειζ, moving the helmet.



*Musophaga*,\* the Plantain-eater.

Likewise an African genus, whose single species is marked with crimson on a violet ground.

These two birds, closely resembling each other, having the bright plumage of the Parrots, with the short, thick, conical bill of the Finches, form, according to Mr. Swainson,† one of the links which connect the Climbers with the Perchers, through the *Conirostres*. They have several characters peculiar, however, to themselves; the thick bill is toothed at the edges like a saw, by which structure a kindred genus is said to cut off the plants on which it feeds close to the root, as if it were done with a saw. In the Violet Plantain-eater, (*M. Violacea*,) the base of the bill is enlarged so as to spread like a helmet over the forehead as far as the crown.

\* *Musa*, the botanical name of the Plantain, and φάγω, *phago*, to eat.

† Cab. Cyc. Birds, vol. ii. p. 126.



HASTINGS'S TRAGOPAN (*Satyrus Hastingsii*), ARGUS PHEASANT (*Phasianus Argus*), and CROWNED PIGEON (*Columba Coronata*).

#### ORDER IV.—GALLINACEÆ.\*

WE begin now to recede from the great distinguishing character of a Bird, viz. a *winged* animal: most of the genera of this order are almost confined

\* *Gallina*, the Latin name of the domestic fowl.

to the earth, and some are utterly incapable of rising into the air at all. Like the hoofed tribes of the Mammalia, to which the Gallinaceæ are usually considered as corresponding in their own Class, they comprise those species which are chiefly ordained to be the food of man; hence their flesh is more agreeable, digestible, and nutritive; their increase is great, and their domestication easy. Their excellence as food has an evident connexion with their feebleness of flight; for, as the muscular force of the whole body in the powerful fliers is concentrated in that action, the texture of the muscles is strong and sinewy, and they are proportionably indigestible and dry. The use of wings in the Poultry-birds is scarcely more than to enable them to reach an elevated roosting-place; when they attempt to fly, their motion is fluttering, painful, and exhausting, frequently accompanied by screams which shew that they are in a state of unnatural excitement. Their food generally consists of the seeds of herbaceous plants, which they can reach on foot; they frequently, however, scratch the earth with their claws, in order to discover seeds, insects, and worms, beneath the surface. The males of many of the species are ornamented with peculiarly resplendent plumage, as well as other remarkable appendages; and their gait, especially in the presence of the females, is proud and stately. Most of them are polygamous, one male being attended by many wives. The largest of all birds are found in this Order: they are also the most inoffensive.

The principal characters of the Order are, short, broad wings, hollow on the under side; a tail composed of from fourteen to eighteen feathers; robust feet, the hind toe, when present, placed on a higher elevation than the others; a bill short, strong, and horny, arched above; nostrils covered with a scale; a very large crop, and powerful gizzard. They are scattered over the whole of the known world.

*Columba,\* the Pigeon.*

Placed by Linnæus with the *Passeres*, but now by general consent admitted into the present Order, the Pigeons may, in truth, be considered as osculant between the two. In many particulars they differ both in structure and habit from these; the feet are comparatively small and slender, the toes placed on the same level; the wings are long, and of powerful flight; the tail composed of but twelve feathers: they are dwellers upon trees, where they seek their food; though some are more exclusively ground-birds, as the Crowned Pigeon, (*C. Coronata*,) a large and magnificent bird of the East Indian Isles, which shews a close alliance with some of the Curassows. They are monogamous, each male attaching himself with an affecting constancy to a single female: they build in trees or other elevated situations, and lay but two eggs. The young are fed for some time with a milky secretion from the crop of both parents. On the other hand the bill is vaulted, the nostrils are scaled, and placed as in the

\* Its ancient Latin name.

Poultry ; the orbits of the eyes are naked, and some of the details of their internal anatomy mark a closer affinity to the present Order than to the Perchers. The loud note of the Ringdove (*C. Torquata*) has a striking resemblance to the crowing of some of the Gallinaceæ, and other species approach very near, even in form and general appearance, to the Domestic fowl ; one species in particular, the Nicobar Pigeon, (*C. Nicobarica*,) by its heavy body, robust scaly feet, and concave wings, by the long, narrow, pointed, coppery feathers of the neck, and by its habitual residence on the ground, perching only on low branches to roost, has been even named by one author\* from its similarity to the common Cock.

The Pigeons are found in every part of the globe, except in the Polar regions ; they are, however, most abundant in the rich islands of the East Indies and the adjacent Archipelagoes. Here they multiply prodigiously, and many of the species are marked by an elegance of form and beauty of colouring unknown to ours. Green is the predominating tint, varied, however, and enlivened with yellow, orange, azure, and purple. Our own northern kinds are marked with soft hues, which, though more sober, have a chasteness and delicacy that are scarcely less pleasing. The tender melancholy character of the voice, termed *cooing*, the peculiarly meek and melting expression of the eye, their parental solicitude, and their conjugal affection, have in all ages marked them out as emblems of peace, and love, and tenderness.

\* *C. Gallus*, by Wäglar.

TURTLE-DOVE (*Columba Turtur*).

The domestic habits of our common Pigeon, which in its native state is an inhabitant of our island, and distinguished as the Rock Pigeon, (*C. Livia*,) are well known, as are also its proneness to run into varieties, some of them being of very singular form, its love for its native home, and the remarkable instinct as well as velocity with which it returns to it after having been removed. We shall prefer to give a few particulars of a foreign species, the most remarkable of its genus, if not of all birds, which, however marvellous and incredible they may appear, are yet authenticated beyond all contradiction.



The Passenger Pigeon, (*C. Migratoria*), of North America, belongs to that division usually denominated Turtles. It is inferior in size to our common Pigeon, and more slender in form; its elegance is increased by its lengthened and pointed tail, the feathers of which diminish from the middle to the edges. But what is so observable and even unparalleled in its economy is the immense hosts, the countless millions that assemble together in their astonishing migrations; undertaken, not as in other tribes, in the search for a more genial clime, but to obtain food, and taking place at uncertain intervals of time. "The beech-nut constitutes," says the accurate Wilson, "the chief food of the Wild Pigeon. In seasons when these nuts are abundant, corresponding multitudes of Pigeons may be confidently expected. It sometimes happens that, having consumed the whole produce of the beech-trees in an extensive district, they discover another at the distance perhaps of sixty or eighty miles, to which they regularly repair every morning, and return as regularly in the course of the day or in the evening to their place of general rendezvous, or, as it is usually called, the roosting-place. These roosting-places are always in the woods, and sometimes occupy a large extent of forest. When they have frequented one of these places for some time, the appearance it exhibits is surprising. The ground is covered to the depth of several inches with their dung; all the tender grass and underwood destroyed, the surface strewed with large limbs of trees, broken

down by the weight of the birds clustering one above another, and the trees themselves, for thousands of acres, killed as completely as if girdled with an axe. The marks of this desolation remain for many years on the spot; and numerous places could be pointed out where, for several years after, scarce a single vegetable made its appearance. When these roosts are first discovered, the inhabitants from considerable distances visit them in the night with guns, clubs, long poles, pots of sulphur, and various other engines of destruction. In a few hours they fill many sacks, and load their horses with them.

“I had left the public road, and was traversing the woods, on my way to Frankfort, when, about one o’clock, the Pigeons which I had observed flying the greater part of the morning northerly, began to return in such immense numbers as I never before had witnessed. Coming to an opening by the side of a creek, where I had a more uninterrupted view, I was astonished at their appearance. They were flying with great steadiness and rapidity, at a height beyond gunshot, in several strata deep, and so close together, that, could shot have reached them, one discharge could not have failed of bringing down several individuals. From right to left, as far as the eye could reach, the breadth of this vast procession extended, seeming everywhere equally crowded. Curious to determine how long this appearance would continue, I took out my watch to note the time, and sat down to observe them. It was then half-past one. I sat for more than an hour; but, instead of a diminution of

this prodigious procession, it seemed rather to increase both in numbers and rapidity ; and, anxious to reach Frankfort before night, I rose, and went on. About four o'clock in the afternoon I crossed the Kentucky River at the town of Frankfort, at which time the living torrent above my head seemed as numerous, and as extensive as ever. Long after this I observed them in large bodies, that continued to pass for six or eight minutes ; and these, again, were followed by other detached bodies, all moving in the same south-east direction, till after six in the evening. \* \* \* If we suppose this column to have been one mile in breadth (and I believe it to have been much more), and that it moved at the rate of one mile in a minute, four hours, the time it continued passing, would make its whole length two hundred and forty miles. Again, supposing that each square yard of this moving body comprehended three pigeons, the square yards in the whole space, multiplied by three, would give two thousand two hundred and thirty millions, two hundred and seventy-two thousand pigeons ! an almost inconceivable multitude, and yet probably far below the actual amount. Computing each of these to consume half-a-pint of mast daily, the whole quantity at this rate would equal seventeen millions, four hundred and twenty-four thousand bushels per day ! Heaven has wisely and graciously given to these birds rapidity of flight, and a disposition to range over vast uncultivated tracts of the earth, otherwise they must have perished in the districts where they resided, or devoured up the whole productions of agriculture, as well as those of the forests.

“A few observations on the mode of flight of these birds must not be omitted. The appearance of large detached bodies of them in the air, and the various evolutions they display, are strikingly picturesque and interesting. In descending the Ohio by myself, in the month of February, I often rested on my oars to contemplate their aërial manœuvres. A column, eight or ten miles in length, would appear from Kentucky, high in air, steering across to Indiana. The leaders of this great body would sometimes gradually vary their course, until it formed a large bend, of more than a mile in diameter, those behind tracing the exact route of their predecessors. This would continue sometimes long after both extremities were beyond the reach of sight; so that the whole, with its glittering undulations, marked a space on the face of the heavens, resembling the windings of a vast and majestic river. When this bend became very great, the birds, as if sensible of the unnecessary circuitous course they were taking, suddenly changed their direction, so that what was a column before became an immense front, straightening all its indentures, until it swept the heavens in one vast and indefinitely-extended line. Other lesser bodies also united with each other as they happened to approach, with such ease and elegance of evolution, forming new figures, and varying these as they united or separated, that I was never tired of contemplating them. Sometimes a hawk would make a sweep on a particular part of the column, from a great height, when, almost as quick as lightning, that

part shot downwards out of the common track; but, soon rising, continued advancing at the same height as before. This inflection was continued by those behind, who, on arriving at this point, dived down almost perpendicularly to a great depth, and rising, followed the exact path of those that went before. As these vast bodies passed over the river near me, the surface of the water, which was before smooth as glass, appeared marked with innumerable dimples, occasioned by the dropping of their dung, resembling the commencement of a shower of large drops of rain or hail."

The description of their breeding-places is not less astounding: Wilson mentions one near Shelbyville, in Kentucky, which "was several miles in breadth, and was said to be upwards of forty miles in extent! In this tract almost every tree was furnished with nests wherever the branches could accommodate them.

"As soon as the young were fully grown, and before they left the nests, numerous parties of the inhabitants from all parts of the adjacent country, came with waggons, axes, beds, cooking utensils, many of them accompanied by the greater part of their families, and encamped for several days at this immense nursery. Several of them informed me that the noise in the woods was so great as to terrify their horses, and that it was difficult for one person to hear another speak without bawling in his ear. The ground was strewn with broken limbs of trees, eggs, and young squab Pigeons, which had been precipitated from

above, and on which herds of hogs were fattening. Hawks, Buzzards, and Eagles, were sailing about in great numbers, and seizing the squabs from their nests at pleasure; while, from twenty feet upwards, to the tops of the trees, the view through the woods presented a perpetual tumult of crowding and fluttering multitudes of Pigeons, their wings roaring like thunder, mingled with the frequent crash of falling timber; for now the axe-men were at work, cutting down those trees that seemed to be most crowded with nests, and contrived to fell them in such a manner, that in their descent they might bring down several others; by which means the falling of one large tree sometimes produced two hundred squabs, little inferior in size to the old ones, and almost one mass of fat. On some single trees upwards of one hundred nests were found, each containing one young only. It was dangerous to walk under these flying and fluttering millions, from the frequent fall of large branches, broken down by the weight of the multitudes above, and which in their descent often destroyed numbers of the birds themselves; while the clothes of those engaged in traversing the woods were completely covered with the excrements of the Pigeons.

“The young, when beginning to fly, confine themselves to the underpart of the tall woods, where there is no brush, and where nuts and acorns are abundant, searching among the leaves for mast; and appear like a prodigious torrent rolling along through the woods, every one striving to be in the front. A



person told me that he once rode furiously into one of these rolling multitudes, and picked up thirteen Pigeons, which had been trampled to death by his horse's feet." \*

The Passenger Pigeon has bred in England. In the year 1832, a pair began a nest on the 25th of April, in the Zoological Gardens, after having been occupied three or four days in selecting a place, which at length they chose in a fir-tree in their inclosure. The female was the architect; but the most laborious office was performed by the male, in collecting and bringing all the materials, principally sticks and straw. On his arrival with each fresh supply, he carefully alighted on the back of the female, so as not to derange any part of her work. The work was completed in one day; and on the next morning a single egg was laid, and the female immediately commenced sitting, in which she was relieved at intervals by her mate. The young bird was hatched in sixteen days. At about the same time another pair bred in the menagerie of the Earl of Derby, at Knowsley.†

*Crax,‡ the Curassows.*

America has produced a few valuable additions to our domestic animals, among which not the least important is the tribe now before us; for, though they

\* Am. Orn., vol. ii., p. 294, *et seq.*

† Proc. Zool. Soc. 1833, p. 10.

‡ Κράζω, *krazo*, to cry out.

are not yet so diffused as to be considered common poultry-birds with us, yet, from the success of the Zoological Society's efforts, and more especially of those of M. Ameshoff, in Holland, the question of their becoming so is no longer doubtful. Gentle and inoffensive in their disposition; staid and quiet in their manners; of large size, and savoury flesh; they may be expected amply to repay the trouble of their domestication; and the prosecution of such experiments as these is one of the most obvious uses of the Zoological and similar societies.

The Curassows, of which there are many species, including the Guans (*Penelope*\*), are nearly as large as a Turkey, and, like that bird, are almost invariably of a deep black, glossed with metallic reflections. One species, however, (*C. Rubra*,) is of a deep chestnut brown. Some of them are adorned with a crest composed of short curled feathers, which look like a number of little globules. In some particulars they resemble the Perchers, such as the level of their toes, and their consequent arboreal habits, perching, and building their nests on the loftiest trees. They live in flocks in South America.

*Meleagris,† the Turkey.*

For this noble bird, also, we are indebted to the American Continent, but to the northern division of it. A second species, however, (*M. Ocellata*,) of

\* The name of an ancient Greek matron.

† Μελέαγρις, *meleagris*, the Greek name of the Guinea Fowl.

great beauty, has recently been discovered in the south of Mexico. The Turkeys are, excepting the Ostriches, among the largest of birds, the male Wild Turkey of the United States (*M. Gallopavo*) attaining the length of nearly four feet, the extent of five, and the height, when erect, of three; while fifteen or twenty pounds may be esteemed their average weight: the writer has partaken of the flesh of one which weighed twenty-five pounds after being plucked; while Audubon speaks of those which have attained the enormous weight of forty pounds.

As a genus, the Turkeys are distinguished by having the head and upper part of the neck covered with a naked warty skin; loose appendages, called wattles, or caruncles, are attached the one to the throat, and the other to the forehead; the latter, when the male is excited, swells so as to cover and hang over the beak. From the breast, *in both sexes*, but most apparent in the male, hangs a tuft of stiff bristly hairs; the coverts of the tail, which are large, can be erected like a fan.

The Wild Turkey appears to have been domesticated in England very quickly after its discovery; but the exact time and circumstances of its introduction have not been recorded. It has much degenerated in size and beauty. In its native condition it still inhabits the Southern and Western States, and Mexico, in considerable abundance; but from the Atlantic country it has been extirpated by the increase of population. The head of this fine bird is small in proportion; the naked skin which covers it is pale blue,

with reddish warts; the plumage of the body is black, glossed with reflections, changing in various lights to green, purple, and bronze. The tail consists of eighteen broad feathers, rusty brown, crossed and mottled with black. The female, as usual, has much less metallic splendour than the male. The singular note of the Turkey, called *gobbling*, is well known, as is also his indignation at any object of a red hue. Like many of the gallinaceous birds, his pride and courage are most conspicuous in the presence of his females; inflating his frontal wattle, arching his neck, and elevating his expanding tail, he struts to and fro in most majestic stateliness; dilating and stiffening the quill-feathers of his wings, and scraping them harshly against the ground as he proceeds, at the same moment uttering a *puff*, as of retained breath. Terrible and fatal battles often occur on such occasions between rival males. They build on the ground, with some attempt at concealment, and the female lays from ten to twenty eggs. They usually roost on the branches of trees; but, except for such a purpose, or to cross a river, rarely have recourse to flight.

A singular mode of taking the Wild Turkey alive is mentioned by Charles Bonaparte, and which we have ourselves seen practised in the Southern States. It is "by means of *pens*, constructed with logs, covered in at top, and with a passage in the earth under one side of it, just large enough to admit an individual when stooping. The ground chosen for this purpose is generally sloping, and the passage is cut

on the lower side, widening outwards. These preparations being completed, Indian corn is strewed for some distance around the pen, to entice the flock, which, picking up the grain, is gradually led towards the passage, and thence into the enclosure, where a sufficient quantity of corn is spread to occupy the leader until the greater part of the Turkeys have entered. When they raise their heads, and discover that they are prisoners, all their exertions to escape are directed upwards, and against the sides of the pen, not having sagacity enough to stoop sufficiently low to pass out by the way they entered; and thus they become an easy prey, not only to the experienced hunter, but even to the boys on the frontier settlements." \*

*Numida, † the Guinea-fowl.*

This bird, of which three or four species are known, has some of the characters of the Turkey; but the tail is short, and incapable of being spread; the wattles are only on the throat, and some possess a helmet-like callosity on the forehead. The general form is nearly round. They are all natives of Africa, and were well known to the ancients. The domestic species (*N. Meleagris*), remarkable for its dark-grey plumage, sprinkled with round white dots, and for the tiresome pertinacity of its cry, sufficiently illustrates the genus.

\* Am. Orn., vol. iv., 175.

† From its native country.

*Pavo,\* the Peacock.*

Perhaps there is not in the whole range of Ornithology a more magnificent bird than the common Peacock. The gracefulness of its shape, the lightness of its elegant crest, its noble size, and its gemmed and glittering train, render it unrivalled even in the gorgeous forests of India. The tail coverts are very long, and being capable of erection, as in the Turkey, but more completely, form an upright circular fan of great breadth, studded with the most lustrous eye-like spots. Beautiful as is the common species (*P. Cristatus*) in captivity, it is yet surpassed by the richer brilliancy of the wild ones, which are still very abundant in some of the forests of India. Colonel Williamson speaks with admiration of the number and beauty of the extensive flocks which he has seen in the Jungleterry District, where whole woods are covered with their plumage, radiant in the beams of the rising sun. No less than from twelve to fifteen hundred he has seen at once, for nearly an hour together. A second species (*P. Javanicus*) is scarcely inferior to this; and there are one or two more, which, though not possessing the magnificence of these two, are yet very beautiful birds.

Nearly allied to the Peacocks, but wanting the long expansible train, is another bird, found in the North of India, the Impeyan Pheasant (*Lophophorus† Refulgens*), as large as a Turkey, whose perpendicu-

\* Its ancient Latin name.

† Λόφος, *lophos*, a crest, and φέρω, *phero*, to bear.



lar crest, and back feathers, gleam with the changing hues of the Humming-birds,—gold, copper, sapphire, and emerald. It appears to be a link between the preceding genus and that of the Pheasants.

*Phasianus*,\* *the Pheasant*.

The true Pheasants, excluding the Common Fowl, which was united with them by Linnæus, have the crown of the head entirely covered with feathers, being destitute of comb or wattles. The tail is long and narrow, the feathers being arranged in two planes, overlapping each other, the two middle ones being considerably the longest. They are all natives of Asia, and seem to increase in beauty the farther we go to the East; until in China we find the beautiful Gold and Silver Pheasants (*P. Pictus* and *P. Nycthemerus*†), the Long-tailed Pheasant (*P. Reevesii*), and the superb Argus (*P. Argus*), which, though destitute of metallic radiance, yet being studded with dark ringed eye-spots, on a bright cinnamon ground, is little inferior in its chastened beauty to the Peacocks, to which, indeed, it bears an affinity.

The Pheasant of our preserves (*P. Colchicus*), long since naturalized in Europe, is perhaps the earliest reclaimed animal whose introduction into Europe can be traced with historic accuracy. It was brought by the adventurous Argonauts into Greece, as early as 1200 B.C. from the banks of the River Phasis,

\* Its ancient Greek name.

† *Νυχθημερον*, meaning, by day and by night.

whence the name. Through so many centuries, however, it has not yet become sufficiently acclimatized to bear our cold and humid atmosphere without protection.

Like most of their kindred, the Pheasants depend more habitually upon their swiftness of foot than upon their power of wing. Their short, concave wings, are sufficient to bear them up from quadrupedal foes, and to raise them to their nightly perch ; but they fly with difficulty and evident reluctance. The Argus Pheasant, to which we have above alluded, is retarded in flight, notwithstanding the size of its wings, by the great developement of their secondary feathers ; it is thereby, however, aided in running, which it does with great velocity. In courting his females, he, like the Turkey, scrubs his beautiful wings against the ground, and erects and opens his long tail, which at other times is carried horizontally extended, and folded together.

*Gallus,\* the Fowl.*

At home in the streets of our crowded cities, as well as in our barn-yards, the common Fowls, though visitants from farthest India, are as familiar to us as “ the Sparrow that sitteth upon the housetop.” The Fowl is furnished with a fleshy crest, or comb, upon the crown, and wattles on the throat : the quills of the tail are fourteen, placed back to back on two planes ; and the tail-coverts, greatly lengthened, ex-

\* Its Latin name.

tend in a graceful arch over the quills in the adult male.

The original of our domestic species is probably the Javanese Fowl (*G. Bankivus*); but many species very much resembling ours are scattered about the Continent and Archipelagoes of Asia. They have many of the habits and manners of the domestic races, joined to extreme shyness and wildness.

*Tetrao,\* the Grouse.*

The name of this large family of birds, which Linæus made to include the Partridges and Quails, is now restricted to the species inhabiting northern climates, having a round or forked tail, and feathered feet. Above the eye is a patch of naked skin of a scarlet hue. The Capercaillie (*T. Urogallus*)† is as large as, if not larger than, the Turkey. This noble Grouse, sometimes called the Heath-cock, and the Cock of the Woods, was at no very remote period an inhabitant of our own island, and even now is common in Sweden and Norway. America produces another, not inferior, the Cock of the Plains (*T. Urophasianus*),‡ distinguished by having twenty feathers in the tail. The Ptarmigan (*T. Lagopus*),§ an inhabitant of snow-covered plains, is feathered to the claws, and becomes pure white in winter, as do some allied species in North America.

\* The Latin name of a kind of pheasant.

† Οὐρὰ, (?) *oura*, the tail, and *gallus*, the cock.

‡ Οὐρὰ, (?) and φασιανὸς, *phasianos*, the pheasant.

§ Λαγὼς, *lagos*, a hare, and πους, *pous*, a foot.

*Perdix,\* the Partridge.*

Receding still farther from the Pheasants than the preceding, in the shortness of the tail, the slenderness of the bill, and the general contour, the Partridges seem to lead through the Quails (*Ortyx*,†)—in some of which the tail is so short as to be nearly imperceptible, and the hind toe entirely wanting,—to the next group we have to notice. The Tinamoos, indeed, (*Crypturus*,‡) are remarkable, in addition, for a long and slender neck. These birds, comprehending many sub-genera, are found scattered over both the Old and New World.

*Otis,§ the Bustard.*

This genus, of which a British species, the Great Bustard (*O. Tarda*), is the largest European bird, is evidently the connecting link between the true Poultry birds and the Ostriches. They have a long neck, and stand high upon the feet; the toes are but three, all pointing forward. They rarely fly, but run very swiftly, assisting themselves, as the Ostrich does, with outspread wings. They feed on grain, and insects, and even small quadrupeds. The Great Bustard, now very rare in England, yet still occasionally seen

\* Its Latin name.

† Their Greek name.

‡ Κρυπτός, *kruptos*, hidden, and οὐρά, *oura*, the tail.

§ The Greek name of the Bustard.

GREAT BUSTARD (*Otis Tarda*).

in Norfolk, on Salisbury Plain, and in a few other open situations, stands nearly four feet high. It is mottled with blackish freckles on a light brown ground. The flesh is excellent food, and formerly it was so esteemed as to be an object of the chase. A smaller species is found in Europe, and several in Africa and Asia.

*Struthio,\* the Ostrich.*AFRICAN OSTRICH (*Struthio Camelus*).

To the naturalist the Ostrich may, perhaps, be considered as the most interesting of all the feathered race, being evidently the form that goes to fill up the chasm between the two classes of Quadrupeds and Birds. In much of its internal anatomy, and in many of its faculties and habits, the Ostrich approaches

\* Its Greek name.



so near to the Camel, as to have been called by widely separated nations the Camel-bird. The wings are so short as to be perfectly useless as organs of flight ; on the other hand, the two legs and feet are large, muscular, and powerful ; unfeathered, and terminated by two hoof-like toes, resembling the cleft foot of the Camel ; there are callosities on the breast and abdomen, on which it rests, in the manner of that quadruped ; internally, the breast-bone has no ridge, but is flat, like that of a beast ; the stomach and intestines are similar to those of a Ruminant, and other resemblances exist, into which, in a work like the present, we cannot enter.

This description, however, applies in its full force only to the African Ostrich (*S. Camelus*), so celebrated from the earliest antiquity. It is scattered over the Continent from Arabia, which, in its geographical peculiarities, may be almost regarded as an African Peninsula, to the Cape of Good Hope, inhabiting the sandy deserts of the north, and the parched plains of the south, across which its extreme velocity well adapts it for running. Adanson, in his Voyage to Senegal, mentions two tame Ostriches, which, he says, “ were so tame that two little blacks mounted both together on the back of the largest ; no sooner did he feel their weight, than he began to run as fast as ever he could, till he carried them several times round the village ; and it was impossible to stop him otherwise than by obstructing the passage. This sight pleased me so well, that I would have it repeated ; and, to try their strength, I made a full-grown

negro mount the smallest, and two others the largest. This burden did not seem to me at all disproportioned to their strength. At first they went a moderate gallop; when they were heated a little they expanded their wings, as if it were to catch the wind, and they moved with such fleetness that they seemed to be off the ground. I am satisfied that they would have distanced the fleetest race-horses that were ever bred in England. I have frequently beheld this sight, which is capable of giving me an idea of the prodigious strength of an Ostrich, and of showing what use it might be of, had we but the method of breaking it and managing it, as we do a horse.” \*

The Ostrich is coveted chiefly for the exquisitely beautiful plumes, of loose texture and curled shape, the feathers of the wings and tail greatly modified, which form so great an ornament of head-dresses in our own country. It is caught with great difficulty. Its food is grain of various kinds, but it also eats grass: the greediness with which it swallows hard and useless substances, even pieces of metal, has been often mentioned; not, of course, that they are either nutritious or digestible, but probably to aid in the mastication of food by the gizzard, as gravel is swallowed by poultry for the same purpose.

The charge of neglecting its eggs, when laid, brought against this bird, in perhaps the most ancient of all poems,† and concerning which so much has been written, seems to be perfectly true, as descrip-

\* Pinkerton's Collection, xvi. 69.

† Job xxxix. 14—16.

tive of its habit in the burning sands of the north; while in the more temperate regions of the Cape, the office of sitting upon the eggs is regularly performed by both sexes. The flesh is coarse and tough, though eatable, and rather well-tasted. They live in flocks, and are the common associates of the Zebras and Antelopes of the south.

The American Ostrich (*S. Rhea*) has much of the manners of the preceding, but is considerably smaller, more thinly feathered, and has three toes. It is common in the southern parts of South America.

*Dromaius,\* the Emu.*

This gigantic bird is second only to the African Ostrich in size, which it represents on the Australian continent, attaining a stature of more than seven feet. It is distinguished from that bird by the total absence of plumes to the wings and tail, and by the still further diminished size of the wings, which are now so reduced as to be useless even for running, and to be invisible when closed; the long, hair-like feathers of the body, which, dividing on the back, fall gracefully down each side, effectually covering them.

The Emu (*D. Novæ Hollandiæ*) is coursed with dogs, and is said to afford good sport. If the dogs be inexperienced, however, they are liable to injury, by being kicked with its powerful foot, with which it is said to be able even to break the bone of a man's

\* *Δρομαῖος*, *dromas*, a runner.

EMU (*Dromaius Novæ Hollandiæ*).

leg. The flesh has been described as “good and sweet eating,” resembling beef in appearance and taste: the eggs also, which are as large as those of the Ostrich, and of a dark-green hue, are much esteemed.

The Cassowary (*Casuarium*\* *Galeatus*) is closely allied to the above; but its head, naked of feathers, is

\* *Casoaris*, the Malay name of the bird. Bontius.

surmounted with a bony helmet, and the neck is furnished with hanging wattles. The presence of the wing is marked merely by three or four stiff-pointed shafts, entirely destitute of barbs. The skin of the head is varied with azure blue, and bright scarlet tints; which, with its nakedness, remind one of some of the Vultures. It inhabits the great Indian Islands, and is but little inferior in magnitude to the Ostrich.

A very remarkable bird, called the Dodo (*Didus*\* *Ineptus*), once an inhabitant of the Isle of France, but now believed to be extinct, has usually been placed with this group; but Mr. Swainson considers, and apparently with reason, that it was rather allied to the Vultures. The only existing remains of the species are, a beak, and one leg, in the Ashmolean Museum at Oxford, and another leg in the British Museum; the relics of a specimen formerly preserved in the museum of John Tradescant. An original painting, apparently taken from a living specimen, is also preserved in the British Museum.† It is by no means impossible that the species may yet exist in the little known regions of South-eastern Africa, or the interior of Madagascar.

There is yet another bird of large size, and singu-

\* Probably a native name Latinized.

† As every trace of this lost form is highly interesting, we gladly add the facts lately recorded in the Penny Cyclop. ART. Struthionidæ: That another painting, bearing all the marks of having been made from the living bird, exists in Savery's "Orpheus and the Beasts," at the Hague; and that the skull of a Dodo has been lately found in the Museum at Copenhagen.

lar form, which has been recently obtained from New Zealand, the *Apteryx*\* *Australis*. It seems to connect the present Order with the succeeding, for it has the long, curved beak of an Ibis, and the notched toes of a Phalarope. The wings are quite concealed, terminating in a single *claw*. It excavates deep holes in the earth in the form of a chamber, in which it constructs its nest of dry grass and fern, and takes refuge when hunted.

A letter from the Rev. W. Yate, accompanying a preserved skin, was read before the Zoological Society, May 12th, 1835. He writes, "About six weeks ago I had one of these birds in my possession, the second I have seen in the land. I kept it nearly a fortnight; and in my absence it died. . . . Its food is long earthworms; it strikes with its bill on the ground, and seems to know by the sound where its prey lies. It then thrusts its bill into the ground, draws up the worm, and swallows it whole and alive. They kick very hard, and their legs are remarkably strong for the size of the bird."†

\* A, without, and πτερυξ, *pteryx*, a wing.

† Proc. Zool. Soc., 1835, p. 61.



CROWNED CRANE (*Grus Pavonina*).

## ORDER V.—GRALLATORES.\*

The length of the feet (*vulgo*, the legs,) of several of the birds we have lately noticed, and also that of the neck, have prepared us in some measure for the usual form of the wading birds, in which these characters are shewn in their greatest development. They are thus enabled to walk into water of considerable depth without wetting their bodies, and to seize fishes and molluscous animals by means of their bill, which is likewise usually lengthened. Most of them have long wings, and considerable power of flight, during which they stretch out their long feet behind them to serve

\* *Grallæ*, a pair of stilts.

as a balance to their head and neck, the tail being generally very short. Many of them run with great swiftness ; some of them swim with a facility equal to that of the true Waterbirds, their toes being edged with broad membranes : some genera want the hind toe. It is an extensive Order, containing birds of great variety of size, form, and habit.

*Ardea,\* the Heron.*

The Herons, with the Cranes and Storks, chiefly birds of large size, are most nearly allied to the long-legged Gallinaceæ. The bill is long and very straight, and is used to transfix fishes, as the bird stands quietly in the water on one foot immersed to the heel. The claw of the middle toe is toothed on its under surface. Including the Bitterns, marked by plumage of yellow, spotted and dashed with black, the genus *Ardea* includes nearly a hundred known species. Their wings are very large and their flight powerful, and hence the common Heron (*A. Cinnerea*) was a favourite bird of game in the old amusement of hawking, the endeavours of each bird to soar above the other being highly exciting to the spectators. Some of the species, called Egrets (*A. Alba*, &c.) are distinguished by the long feathers of the back assuming the form of slender plumes of great delicacy. The movements of the Herons are marked by much elegance and grace.

\* Its ancient Latin name.

*Grus,\* the Crane.*

More terrestrial in their habits than the Herons, the Cranes seek their subsistence from the worms and insects of marshy meadows, often, however, feeding on grain. The common Crane of Europe (*G. Cinerea*) is more than four feet in height; the feathers of the rump are black and curled into long plumes, while in the Demoiselle (*G. Virgo*) these feathers hang gracefully downwards. The Demoiselle is also adorned by a tuft of white feathers, elegantly passing off behind the eyes; and the Crowned Crane (*G. Pavonina*) has a still more beautiful and singular head-dress, in a crest of diverging filaments standing up from the back of the head, somewhat like the crest of a Peacock, but much more numerous. Both these inhabit Western Africa.

*Ciconia,† the Stork.*

The long and strong beak of this genus enables it to attack and overcome stronger prey than the preceding. Snakes and frogs, as well as fishes and insects, form its natural prey; and, on account of its services in destroying disagreeable and noxious reptiles, it has been held in universal esteem, amounting almost to veneration. The White Stork (*C. Alba*) is well known on the continent from its fearless familiarity with man, stalking about the

\* The Latin name.

† The Latin name.

crowded streets with perfect unconcern, and building on the houses and chimney-tops. It occasionally visits our shores. It is proverbial for its affection for its young; and there is an oft-repeated story of a Stork which, during a conflagration at Delft, chose calmly to perish with her unfledged young, rather than desert them; having in vain endeavoured to carry them away. The Black Stork, (*C. Nigra*,) likewise an European species, is much more shy and retiring in its manners.

*Platalea,\* the Spoonbill.*

But for the singular form assumed by the beak in this genus, we could scarcely distinguish it from the Storks; this organ, however, long, broad, and flattened through its length, is dilated at the end to a great width, the two mandibles forming two plates of a somewhat triangular shape. They dabble in the mud for worms and molluscous animals like the Ducks, to which their broad bill and slightly webbed toes shew an approach.

The White Spoonbill (*P. Leucorodia* †) is a migratory inhabitant of Europe and Africa, extending even to the Cape of Good Hope. It is sometimes found in England, and is occasionally exhibited for sale. A few weeks ago, (May, 1842,) the writer observed three exposed at a large poulterer's shop on Holborn Bridge. A more beautiful

\* Πλατύς, *platys*, broad.

† Λευκός, *leukos*, white, and ῥόδον, *rhodon*, a rose.

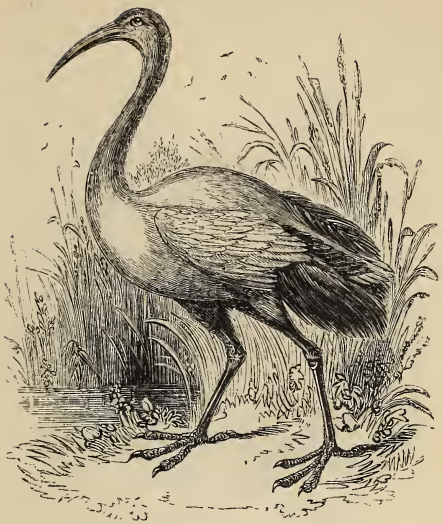
species, the Roseate Spoonbill (*P. Ajaja*\*) inhabits the shores of tropical America; its hue is pale rosy, enlivened with deep rich crimson.

*Ibis,† the Ibis.*

An object of religious veneration among the ancient Egyptians, we find the form of the Ibis recurring on their astonishing monuments at every turn, and multitudes of the birds are discovered as embalmed mummies. It is, however, a remarkable fact, that only within a few years has this ancient and celebrated bird been identified with any living species, though it is still common in its original country. The *Ibis Religiosa* much resembles the Curlews, the bill being long and curved, but rather stouter than in that genus. America produces a splendid species, the Scarlet Ibis, (*I. Rubra*;) entirely scarlet, except the tips of the wings, which are black; and Steedman says of a South African species, — “I succeeded in shooting a very fine specimen of the Bald Ibis, (*I. Calva*,) of which vast numbers appeared to be building their nests in the clefts of the rocks. The bird is about the size of the *I. Religiosa* [or of the common Curlew]; its colour is a dark bright green, having on its wings a rich velvet patch of gold-coloured feathers. The legs and head are entirely bare, of the most beautiful vermilion, and contrasting beautifully with its

\* Probably the *native* name of the bird.

† Its ancient Greek, or Egyptian, name.

SCARLET IBIS (*I. Rubra*).

glittering plumage. When alive it is altogether one of the handsomest birds in South Africa, but loses much of its natural beauty when life is extinct.”\*

*Numenius,† the Curlew.*

These birds differ little from the last, except in that the front of the head is clothed with feathers. The species are few, but widely scattered.

\* Wanderings in S. Africa, vol. i. p. 174.

† “From *néoménie*, new moon, from its crescent-shaped bill.”—Cuv.



*Scolopax,\* the Snipes.*COMMON SNIPE (*Scolopax Gallinago*).

A very peculiar air is given to these birds by their thin heads, flattened sideways, in which the large eye is situated very far back. The bill is long and straight. They fly well, and if endeavouring to escape drop suddenly into the woods, and run swiftly in another direction through the under-wood. The common Snipe, (*S. Gallinago*,) and

\* Their ancient Greek name.

WOODCOCK (*Scolopax Rusticola*).

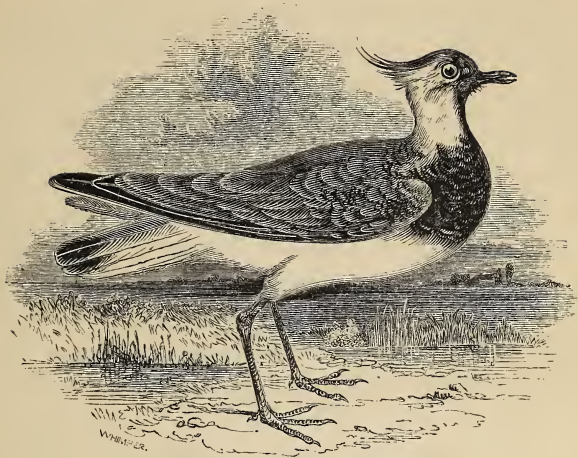
the Woodcock, (*S. Rusticola*), of our own country are examples. The plain tints of the species are, in general, prettily arranged in minute freckles or finely wrinkled lines.

*Tringa, the Sandpipers.*

The Sandpipers are closely allied to the Snipes, but are usually less in size. They abound on every shore all over the world, making the beach lively as they course swiftly over the sands, or take short flights, or run into the water wagging their short tail, and uttering their shrill whistling cries. The venerable American naturalist, Wil-

liam Bartram, was witness to a touching instance of maternal courage and affection in a bird of this genus (*T. Macularia*). He informed Wilson "that he saw one of these birds defend her young for a considerable time from the repeated attacks of a Ground Squirrel: the scene of action was on the river shore. The parent had thrown herself, with her two young behind her, between them and the land; and at every attempt of the Squirrel to seize them by a circuitous sweep, raised both her wings in an almost perpendicular position, assuming the most formidable appearance she was capable of, and rushed forwards on the Squirrel, who, intimidated by her boldness and manner, instantly retreated; but, presently returning, was met as before in front and on flank by the daring and affectionate bird, who with her wings and whole plumage bristling up, seemed swelled to twice her usual size. The young crowded together behind her, apparently sensible of their perilous situation, moving backwards and forwards as she advanced or retreated. This interesting scene lasted for at least ten minutes; the strength of the poor parent began evidently to flag, and the attacks of the Squirrel became more daring and frequent, when the benevolent spectator, like one of those fabled celestial agents who, in Homer's verse, so often decide the palm of victory, stepped forward from his retreat, drove the assailant back to his hole, and rescued the innocents from destruction."\*

\* Am. Orn. vol. iii. p. 90.—(Con. Mis.)

*Charadrius,\* the Plover.*LAPWING (*Charadrius Vanellus*).

The Plovers can scarcely be distinguished from the Sandpipers, except by being entirely destitute of the back toe, which even in the latter is often very small and scarcely available. Their food is nearly the same, but to obtain it the Plovers chiefly resort to more inland situations, some haunting stony downs and dry barren plains, and others the meadows and marshes. They too are dispersed over the world, and are in general chastely and elegantly spotted with sober colours. The Golden Plover (*C. Pluvialis*) is an European example; and the

\* The Greek name of a bird that ran in ditches.

beautiful crested Lapwing or Peewit, (*C. Vanellus*,) is another. This latter, however, has a small hind toe.

One of the most remarkable birds of this group is the Stilt Plover, (*Himantopus* \* *Melanopterus*, †) whose extreme length and slenderness of leg and foot render the action of walking painful and difficult. Of one mentioned by White, which weighed but four ounces and a quarter, the limbs measured from the commencement of the naked part to the ground, *eight inches*; added to which it has no back toe. It is unfortunately so very rare, that its manners, which must be highly interesting, are almost unknown: it is believed, however, to wade much in deep water.

*Recurvirostra*, ‡ the *Avocet*.

This is a singular form; to the general appearance of the Plovers it adds the feet of the *Palmipedes*, being webbed nearly to the ends of the toes. The beak also is curved in an upward direction at the point. The birds of this genus, which are few in number, appear to be very aquatic in their habits, and are said to feed not by boring, but by scooping in shallow water. The four species known belong respectively to Europe, Asia, America, and Australia.

\* ἱμάς, *himas*, a thong, and πούς, *pous*, a foot.

† Μέλας, *melas*, black, and πτερόν, *pteron*, a wing.

‡ *Recurvo*, to bend back, and *rostrum*, the beak.

*Rallus,\* the Rail.*

This, with the allied genera, is marked by a stronger developement of the legs and feet ; the toes, and especially the hinder one, are lengthened, to enable the bird to walk on the grass of marshes, water-plants, &c. The body is singularly thin, as if flattened sideways, adapting it to run between the stems of reeds and other plants which grow close together. Some of them by means of their dilated toes can swim and dive with ease and grace. They feed chiefly on seeds.

The Corn Crake, or Landrail, (*R. Crex*,) named from its harsh, rattling note, can rarely be induced to take wing, but it runs with great rapidity. A young one in the possession of Mr. Jewis “seemed highly delighted when water was placed for it. It would swim, dive to the bottom, and play about, with the greatest satisfaction, and with as much activity as if it had never been used to any other element. Its manners were peculiarly pleasing and interesting, and its motions elegant. It ran with great swiftness, with its head nearly to the ground. The form of the Corn Crake seems admirably calculated for the life it is intended to lead ; its sharp, compressed bill and narrow head are well adapted for separating the grass, and opening a way for its slender and gently swelling body. By this means, the movement of the blades of grass is so small,

\* The English name Latinized.



that it is enabled to make its way rapidly through the meadows without being perceived, so that one moment it may be close at hand, and in the next be at the far side of the field without our being able to discover in what manner it has changed its situation.”\*

*Parra, † the Jacana.*

This is a singular genus of foreign birds, remarkable for the enormous length of the toes, armed likewise with long nails, which structure enables them to walk with freedom over the floating leaves of water-lilies and similar plants. The face and throat are furnished with fleshy wattles, and the shoulder of the wing is armed with a sharp spur. They are brilliantly coloured birds, inhabiting tropical America and western Asia, and are said to be noisy and quarrelsome in their manners.

*Fulica, ‡ the Coot.*

We now discover a manifest approximation to the true Waterbirds; the bill, shortened and flattened, runs up on the forehead in the manner of many of the Ducks, and the toes, though not united by a continuous web, are yet dilated by a broad scalloped membrane at their edges, which answers the same purpose quite as effectually. The Coots are, in fact, more aquatic than terrestrial in their habits,

\* Hort. Reg. Nov. 1831, p. 218.

† The Latin name of an unknown bird.

‡ Its Latin name.

even building their nest, as is asserted, upon the surface of the water among the reeds, which alone prevent it from being carried away with the current. This, it is true, seems somewhat improbable: they take to the water, however, readily, and dive with great facility. Mr. Rennie states that he has seen a young brood of the Gallinule, or Moorhen, (*F. Chloropus*,\*) evidently not above two days old, dive instantaneously, even before the watchful mother seemed to have time to warn them of his approach, and certainly before she followed them under water.† Yet there is much of the manners of the Rails about them, for “the Coot, (*F. Atra*,)” as Wilson affirms, “has an aversion to take wing, and can seldom be sprung in its retreat at low water; for, although it walks rather awkwardly, yet it contrives to skulk through the grass and reeds with great speed, the compressed form of its body, like that of the Rail genus, being well adapted to the purpose;”‡ and Mr. Rennie, commenting on this passage, adds,—“We have often marked its progress by the top of the herbage, on the edge of a lake, moving as if it had been swept by a narrow current of wind.”§

Some foreign species are beautifully ornamented with fine hues of green, blue, and violet, and are said to convey food to the beak with one foot in the manner of the Parrots; a very curious circumstance, if true.

\* *Χλωρός*, *chloros*, green, and *πούς*, *pous*, a foot.

† *Hab. of Birds*, p. 216.

‡ *Am. Orn.* vol. iii. p. 123.

§ *Fac. of Birds*, p. 220.



ALBATROSS (*Diomedea Exulans*), KING PENGUIN (*Aptenodytes Patagonica*), and NORTHERN DIVER (*Colymbus Glacialis*).

#### ORDER VI.—PALMIPEDES.\*

The last of the great divisions of this Class answers to the Cetacea of the Mammalia, and, like it, brings us into close proximity with the Fishes. It is strongly marked by the structure and position of the feet: they are in general short and thick; with the toes united by a continuous membrane, called the

\* *Palma*, a palm, and *pes*, a foot.

web ; and are placed behind the centre of gravity when the body is horizontal. Hence, though their use as walking organs is much diminished, their power as *oars* is proportionally increased, and, consequently, the birds move with great velocity both upon and through the water ; in other words, they swim and dive well. The plumage is peculiarly thick, soft, and close, constituting an almost impervious protection against the chilling influence of the element on which they live. They are the only birds in which the length of the neck exceeds that of the feet ; a necessary provision, to enable many of them to obtain their food at the bottom while swimming on the surface. Their flesh has a remarkable tendency to produce oily fat, another point in which we trace an analogy with the Cetacea. The wings vary much ; while in some they vie with the longest and most powerful of the whole Class ; in others they have dwindled down to mere fins, utterly useless as organs of flight. Their food consists almost exclusively of fish ; but a few of those whose range is confined either to the fresh waters, or the vicinity of the shore, feed also on mollusca and insects, and occasionally on vegetable matters.

Cuvier arranges the Swimming Birds into four families, as follows :—

## FAMILY I.—THE DIVERS.

In this family we find two marked relations to other animals: in the lobed feet of the Grebes, and in their manners, we recognise a close affinity with the Coots of the Order we have just left; while, in the fin-like wings, scaly feathers, and flattened feet, placed far behind, of the Penguins, we almost lose the form and habit of a Bird in those of a Fish, or rather, perhaps, those of a Turtle. These characters, namely, feet near the tail, very short and feeble wings, a dense and polished plumage, with the powers of swimming and diving in high perfection, mark in various degrees the whole family. They have a wide geographical range, but are chiefly inhabitants of the cold climates both of the northern and southern hemispheres.

*Podiceps,\* the Grebe.*

We have already alluded to the peculiarity of this genus, the toes being dilated into broad oval plates. Habitually running among stems of plants, reeds, &c., a web-foot would be more inconvenient and liable to injury than one in which the toes are free.† They are, however, more aquatic than the Coots, being less adapted for walking, but swimming with much greater facility. “They do not dabble, like Ducks, but plunge freely into the water, and dash

\* Mudie, Birds, p. 279.

† Πούς, *pous*, a foot, and κεφαλή, *kephale*, the head; perhaps from the tufts with which the head is furnished.

along, not by alternate strokes of the feet, as in a common walking motion, but by striking with both at once, as a Frog does.”\* The head, in most of the species, is furnished with tufts, as may be seen in our little Dabchick, (*P. Minor*.)

*Colymbus,† the Diver.*

The feet now assume the form peculiar to the Order, the toes being united by a membrane stretched between them; the hind toe is still free. There are but three species, all Arctic birds, but occasionally seen on the coasts of Britain. They are of considerable size, the Loon (*C. Glacialis*) being two feet six inches in length. It is of a blackish hue, prettily varied with round white dots. It walks, from the position of the feet, very awkwardly. One in the possession of Colonel Montagu, when it quitted the water, shoved its body along upon the ground like a Seal, by jerks, rubbing the breast against the ground, and returned again to the water in a similar manner.‡ It is difficult to shoot these birds, as they dive with incredible velocity the instant the trigger is pulled.

*Uria,§ the Guillemot.*

With the smooth, straight, pointed beak of the Divers, the Guillemots differ from them, in having short and powerless wings, and in wanting the hind

\* Mudie, Birds, p. 280.

† Κολυμβάω, *kolymbao*, to dive.

‡ Orn. Dic., p. 309.

§ The Latin name of a kindred bird.

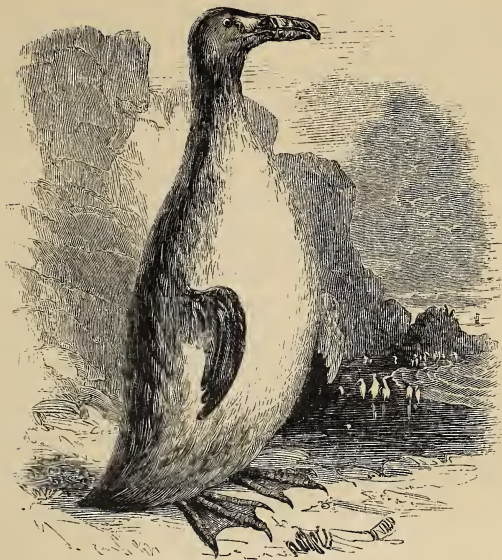


toe. They inhabit precipitous rocks on the sea-coasts, where they breed in vast congregations. We have seen the air round some high barren rocks in the Gulf of St. Lawrence, called the Bird Islands, so filled with these birds, as to appear at a distance as if enveloped in smoke. The Great Guillemot (*U. Troile*) breeds on the coasts of Scotland: the egg is remarkable for its great size, conical shape, and the irregularity of its markings, scarcely two being found alike. The glaire hardens, by boiling, only so far as to become a pellucid jelly.

*Aptenodytes,\* the Penguin.*

Through the Puffins, whose small wings are just able to sustain them an instant in the air, and the Auks, in which these organs are totally deprived of the power of flight, we come to the Penguins, the lowest group of Birds, whose minute wings, covered with vestiges of feathers that look like scales, strongly resemble in appearance and use the flippers of a Turtle, and whose feet are placed so far behind that the bird, when standing, which it can do only in a plantigrade fashion, is erect. The whole of the foot is widened and flattened, like that of a Seal. Utterly deprived of flight, the motion of walking is almost denied to them, and one species can move on land only by short, shuffling leaps, or by drawing themselves awkwardly along on their bellies. Once in the water, however, “they swim with the ease and rapidity of a fish, springing several feet over any ob-

\* Α, without, πτερόν, *pteron*, a wing, and δύτης, *dytes*, a diver.

GREAT AUK (*Alca Impennis*).

ject that may impede their progress, and then once more continuing their course." They are, in general, large birds, inhabiting the southern extremities of the great continents and adjacent islands, where they are said to excavate the earth into burrows, to deposit their eggs.

Mr. Bennett has communicated some particulars of their habits, in a paper read before the Zoological Society. "He describes particularly a colony of these birds (the King Penguin, *A. Patagonica*,) which covers an extent of thirty or forty acres, at the north end of Macquarrie Island, in the South

Pacific Ocean. The number of Penguins collected together in this spot is immense; but it would be almost impossible to guess at it with any near approach to truth, as, during the whole of the day and night, thirty thousand or forty thousand of them are continually landing, and an equal number going to sea. They are arranged, when on shore, in as compact a manner, and in as regular ranks as a regiment of soldiers; and are classed with the greatest order, the young birds being in one situation, the moulting birds in another, the sitting hens in a third, the clean birds in a fourth, &c.; and so strictly do birds in similar condition congregate, that should a bird that is moulting intrude itself among those which are clean, it is immediately ejected from among them.

“The females hatch the eggs by keeping them close between their thighs; and if approached during the time of incubation, move away, carrying the eggs with them. At this time the male bird goes to sea and collects food for the female, which becomes very fat. After the young is hatched, both parents go to sea, and bring home food for it; it soon becomes so fat as scarcely to be able to walk, the old birds getting very thin. They sit quite upright in their roosting-places, and walk in the erect position, until they arrive at the beach, when they throw themselves on their breasts, in order to encounter the very heavy sea met with at their landing-place.”\* This species has a long slender beak; but some have it broad, and flattened sideways, shaped like the blade of a thick pocket-knife.

\* Proc. Zool. Soc., 1834, p. 34.

## FAMILY II.—THE LONG-WINGS.

Very different from the last, the birds before us are remarkable for their long-sustained, swift, and vigorous flight, confiding in which, they launch fearlessly forth into “the desert and illimitable air,” sweeping over the ocean many hundred miles from land. In crossing the Atlantic in various directions, and in its widest part, we have seen the Gulls and Petrels as constant companions in every part of our course. They are, in fact, found in every ocean, and on every shore. The length of their wings is their chief distinction; the hind toe is either almost or altogether wanting, yet they are expert at walking. The bill in some is hooked at the end, and in others simply pointed.

*Procellaria,\* the Petrel.*

The Stormy Petrel (*P. Pelagica*†) is peculiarly the sailor’s bird; rarely visiting the land, and confining its visits to the cliffs and rocks of the coast, it traverses the wide ocean on untiring wing, and fails not to cultivate acquaintance with every passing bark that crosses its course. It has been the subject of an unfounded superstition among seamen, that, in some unknown mode, it is connected with the production of tempests; which has been palliated by the assertion that “it is peculiarly numerous immediately

\* *Procella*, a tempest.† Πελαγος, *pelagos*, the sea.

preceding and during a gale;" and that it seeks the shelter of the ship, as a refuge; both of which suppositions we regard, from the personal experience of many voyages, as utterly groundless. The following notes were made by the writer, in a voyage to the Gulf of Mexico a few years since, and may not be unacceptable: "The Petrels are pretty little birds, and as they come close under the stern, with a most confiding sense of security, I am never weary with watching them. They will follow in the wake of a vessel for days together, apparently without sleep, or even rest, for I have never seen them attempt to swim. The greasy particles in the dish-washings, crumbs of bread, &c., which are constantly being thrown overboard, afford food to the birds, which eagerly examine the surface of the water in the wake for whatever floats. One afternoon, in a calm, I amused myself by feeding them; picking off little bits of meat, and throwing them into the water, which the Petrels would instantly discover and pick up. The bits of fat swam, and the bird, flying over them, would descend close to the surface, put down its little web-feet, to paddle the water, keeping the wings expanded, and take the morsel up with its beak, rising into the air to eat it. If a bit of lean were thrown down, it would begin to sink, and the birds would dive after it, not first alighting on the surface, but going right under, perpendicularly, from the air. I saw some go down to the depth of two feet, or more, the wings continuing expanded all the time. They would come out perfectly dry, and *mount from the*

*water into the air perpendicularly*, just as they went down. This was the most amusing part of the exhibition. One of them having got hold of a piece too large to be swallowed, instantly flew away sideways to a long distance out of the ship's wake, to eat it free from interruption; for they sometimes chase each other, as chickens do when one has a morsel of unusual size. I do not conceive that the feet are put down for the purpose of walking on the water, as generally stated, for they are quite submerged, but, perhaps, merely to feel the water, as a guide to indicate their nearness to the surface, while seizing their food; the wings being quite sufficient for their support. They are quite silent by day, except that they sometimes utter a faint chirp; but at night they often make an unpleasant screaming. They are the smallest of web-footed birds, being scarcely so large as a Swallow, to which, in their manner of flight, they bear a considerable resemblance."

*Diomedea,\* the Albatross.*

Its great size, strong, trenchant, hooked beak, long, powerful wings, and rapacious disposition, seem to mark out the Man of War Bird, as it is also called (*D. Exulans*), as the representative of the Eagles and Falcons. It pursues the hapless Flying-fishes with inexorable voracity, in their brief aërial attempts to escape from their open-mouthed enemies below. Its voice has been much exaggerated; but Dr. M'Mur-

\* The Greek name of an island bird.



trie describes it as resembling the clang of the Goose, but deeper.

*Larus,\* the Gull.*

A numerous and noisy tribe, of rather elegant form and colour, diffused over all shores, and in all seas, and occasionally making considerable excursions inland. They are more at home on the land and in the air than most of their brethren; but this pre-eminence is attended with a diminution of their swimming and diving powers. The bill is slender, and the legs long; so that their appearance reminds one of some of the Waders, to which their colours, usually black, grey, and white, contribute. They devour all animal, and even vegetable, matters. The most common species on our coasts is the great Herring Gull (*L. Argentatus*); one of which, in 1832, “struck one of the mullions of the Bell Rock Lighthouse with such force, that two of the polished plates of glass, measuring about two feet square, and a quarter of an inch in thickness, were shivered to pieces, and scattered over the floor in a thousand atoms, to the great alarm of the keeper on watch, and the other inmates of the house, who rushed instantly to the light-room. The Gull was found to measure five feet between the tips of the wings. In his gullet was a large herring, and in his throat a piece of plate-glass of about one inch in length.”†

\* The Greek name of the Gull.

† Popular Zoology, p. 372.

*Sterna,\* the Tern.*

Resembling the Gulls, but with excessively long and pointed wings, and a very forked tail, the Terns are often called Sea-swallows, their swift and rushing flight, as well as their figure, reminding the beholder of the true Swallows. They are usually of a pearly grey, with black on the head, and a white belly. The Noddy (*S. Stolidus*) differs from other Terns in its tail, though long, being entire. Its common appellation is derived from its stupid, headlong manner of alighting on vessels.

*Rhynchops,† the Shearwater.*

The best known species of this genus is the Black Skimmer, or Shearwater (*R. Nigra*), a native of the American coast. It is one of those unusual forms on which Buffon was wont to dilate with misdirected eloquence, attempting to shew the imperfection of their structure, and the want of wisdom in the creating Deity. “Such ignorant presumption, or rather impiety,” observes Wilson, whose just indignation was always roused by such malignant, though abortive efforts; “ought to hide its head in the dust, on a calm display of the peculiar construction of this singular bird, and the wisdom by which it is so admirably adapted to the purposes or mode of existence for

\* The English name, *Tern* or *Stern*, latinized.

† ‘Ρύγχος, *rhynchos*, a beak, and ὤψ, *ops*, the countenance.

which it was intended.”\* Its peculiarity consists in the bill, the lower mandible being much longer than the upper, which is thin, and falls into the lower like the blade of a knife into the haft. This singular organ is thus used: the bird, skimming along the surface of the ocean on its broad and powerful pinions, opens its beak, and allows the lower mandible to cleave the water, scooping up the shrimps, small fry, spawn, and mollusks that come in its way. Many beautiful contrivances aid this operation, and prevent attendant inconveniences, which we cannot here particularize, amply sufficient, however, to justify Wilson’s defence.

#### FAMILY III.—THE WHOLE-WEBS.

The hind-toe in these birds is no longer free, but united to the rest by the common membrane; notwithstanding which, they are enabled to perch on trees, which few other swimming-birds can do. “They are good swimmers, and some of them, at least, can dive; but the peculiar structure of their feet, and the use which they make of them in walking up to the surface of the water after they have plunged into it from a considerable height, render them very distinct from the other sea-birds.”†

\* Am. Orn. vol. iii. p. 148.

† Mudie, Birds, p. 152.

*Pelecanus,\* the Pelican.*PELICAN (*P. Onocrotalus*).

This is the principal genus of the family. It is remarkable for its long, straight, flattened beak, hooked at the tip, and for the membranous bag which depends from the lower mandible, capable of being dilated to an enormous extent.

The common Pelican (*P. Onocrotalus*)† is as large as a Swan, white, tinged with flesh colour. It feeds on fish, which, it is said, during incubation, to transport

\* Πελεκάν, *pelekan*, its ancient Greek name.

† Όνος, *onos*, an ass, and κρόταλον, *krotalon*, a braying: from its voice.

to its young in its pouch. Its greedy voracity, and awkward mode of running, or rather shuffling along, assisted by the outspread wings, are well seen in the very amusing way in which these birds are fed in the Surrey Zoological Gardens.

The Cormorants (*Carbo*\*) differ little from the Pelicans, except in having these characters in a less degree: their colours are brown and black. Some of them are trained by eastern nations to catch fish for man.

In the Gannets (*Sula*†) the throat is not dilatable; and their size does not exceed that of a Goose. They are found on our own coast.

The Frigate Pelican (*P. Aquilus*) is the most formidable of the aquatic birds. "Its keen sight, its crooked beak, its short, robust, and plummy legs, its sharp claws, the vast extent of its wings, and its rapid flight, all shew that it is the oceanic representative of the king of birds. If the peaceful Flying-fish seeks a refuge from its aquatic enemies by elevating itself into the air, the Frigate-bird darts upon it like a thunderbolt, and devours it. If the Booby [or Gannet] has caught a fish, like the Bald Eagle the Frigate-bird often compels it to let go its prey, and seizes it before it reaches the water."‡ Thus, as in the Albatross already described, we see how this, the lowest Order of Birds, connects itself with the highest, affording a beautiful illustration of the

\* *Carbo*, a coal.

† *Σύλας*, *sule*, prey.

‡ Kirby, Bridgewater Treat., on Hab. and Inst. of Animals, vol. ii. p. 452.

circular plan on which the animal world seems to have been primarily formed.

#### FAMILY IV.—THE BROAD-BILLS.

This well-marked division comprises such birds as have a thick, flattened bill, covered with a membrane instead of horn, the edges of which are beset with narrow ridges, or teeth; a tongue thick and fleshy, and notched at the edges; and toes well webbed. Most of them possess a medium power of flight; but they do not, in general, wander far from the land, many being confined to rivers, and inland lakes, or ponds. In form and habit this family seems to be more closely allied to the Divers than to either of the others.

#### *Phœnicopterus,\* the Flamingo.*

Regarding the long feet and naked legs of this bird, Cuvier, and all preceding zoologists, arranged it with the Waders, with which, indeed, it has much in common. The thickness of the bill, however; the tooth-like ridges on its edges; the fleshy, large, and notched tongue; and the feet decidedly webbed, justify Mr. Swainson in placing it among the Ducks, as the connecting link by which the two Orders are most obviously united. The neck and legs of this bird are of great length; the head is small, but the

\* Φοῖνιξ, *phoenix*, scarlet, and πτερόν, *pteron*, a wing.



bill disproportionately large, with a sudden bend in the middle, as if it had been broken ; the tongue fills the whole cavity, and is furnished on each side with projections pointed backward. The hind toe is very short. They inhabit the warm parts of both continents, chiefly affecting the marshy shores, where they feed on shell-fish, worms, and insects. The nest is as singular as their own form : it is a conical hillock, formed of mud or clay, with a small hollow at the top, to receive the eggs. The base of these nests is usually in the shallow water ; but the summit is a foot and a half above. The female seats herself astride upon this column, her feet resting on the ground in laying and sitting.

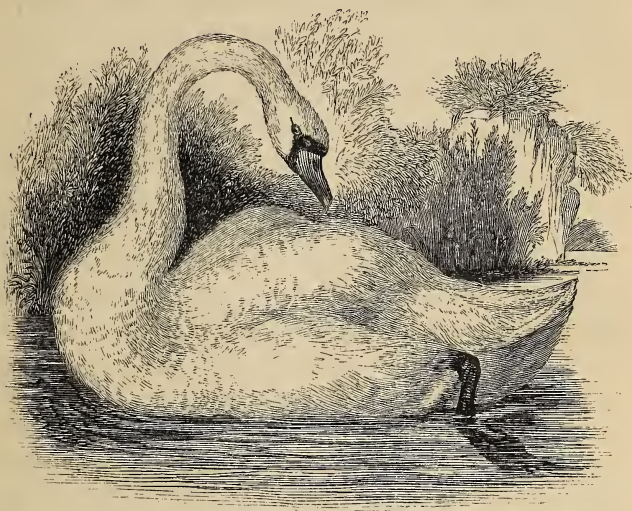
The Flamingo of the ancients (*P. Antiquorum*) is confined to the old continent : it is all over of a deep crimson, except the wings, which are pale rose-pink, with black quills. That of America (*P. Ruber*) is entirely of a bright red. Their height when erect is about four feet.

*Cygnus,\* the Swan.*

The large size of these birds, and their great length of neck, seems in some measure to connect the Flamingoes with the Ducks. Their beak is of equal breadth throughout ; but very deep at the base ; the cheeks bare. They feed chiefly on the seeds and roots of water-plants, uniformly refusing fish. They do not dive, but swim with much elegance and ease,

\* Κύνος, *kynnos*, the swan.

arching their long neck in the most graceful and beautiful curves. They frequently expand their sail-like



SWAN (*Cygnus Olor*).

wings to catch the wind as they float along. They fly at a great elevation, protracting their course to great distances in their annual migrations.

The common Red-billed Swan (*C. Olor*), so generally and so deservedly a favourite on our lakes and rivers, is the most elegant in its form and motions. Its plumage is of the purest white; its attitudes are the most majestic and graceful imaginable; and its manners are inoffensive, sociable, and gentle. Its great muscular strength, however, renders it a for-

midable adversary when attacked; and, when maternal love has endowed her with a courage not her own, the female Swan has been known to break a man's leg with one blow of her wing. In the pairing season the male will fight obstinately with any rival daring enough to approach his retreat; and these battles are conducted with such desperation that one is generally destroyed. It attains a great age; an instance is on record, in which one was known to have lived a hundred years.

The Black Swan of New Holland (*C. Plutonium*), a proverbial contradiction among the ancients, is becoming quite common with us. It is much less graceful in its manners than our native species.

*Anser,\* the Goose.*

The Goose is too familiar with us to need much description; it is distinguished from the Swans by a shorter neck, and a beak tapering towards the end; the cheeks are feathered. The legs are longer than in the Ducks, and placed farther forward, so as to be under the centre of gravity; hence they walk with greater ease, and with less of that awkward *waddle* which characterizes the Ducks.

Few birds contribute more to our service and comfort than the tame Goose (*A. Cinereus*): though the leaden bullet has displaced the "clothyard shaft" of our forefathers, together with

"The gray goose-wing that was thereon;"

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\* Its Latin name.

and though the steel pen is usurping the position of the goose-quill, still the softness of its feathers, and the sapidity of its flesh, will cause it to be for a long time an important tenant of our farms and fens. The Goose is the only bird that feeds on grass.

The Barnacle Goose (*A. Leucopsis*)\* is remarkable for its having been the subject of one of the silliest and most ridiculous notions ever entertained, and that not in the minds of the vulgar, but of philosophers and even naturalists. It was, that this bird is produced in vast numbers on the Scottish shores from trees, in the manner of fruit, suspended by the bill; and veritable, sober men affirmed that they had actually seen this with their eyes! The fable doubtless refers to a common shell, (*Lepas*,) adhering to floating timber.

There are, in the Proceedings of the Zoological Society for 1834,† two interesting papers from Lord Stanley, respecting the habits of a newly-introduced species, the Sandwich Island Goose, (*A. Sandvicensis*,) which had reared a young one in his menagerie at Knowsley.

### *Cereopsis*.‡

Closely allied to the Geese, yet differing from them in many important particulars, the *Cereopsis*

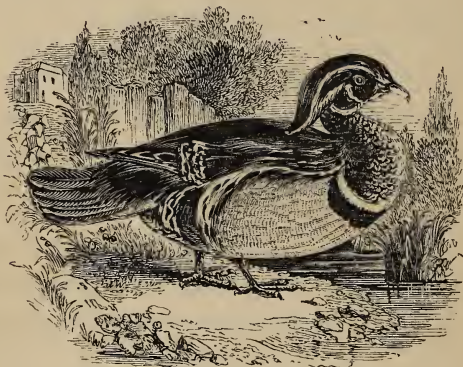
\* *Λευρός*, *leukos*, white, and *ὄψις*, *opsis*, the face.

† Pp. 41 and 81.

‡ *Κηρός*, *keros*, wax, (the cere,) and *ὄψις*, *opsis*, the face.

of New Holland, (*C. Novæ Hollandiæ*), was for some time arranged with the Waders. The legs are naked for a considerable space above the heel joint, the hind toe does not touch the ground, and the webs of the feet are much divided. The bill is remarkably short, and the cere covers a large portion of the face ; the tail-feathers are sixteen.

*Anas,\* the Duck.*



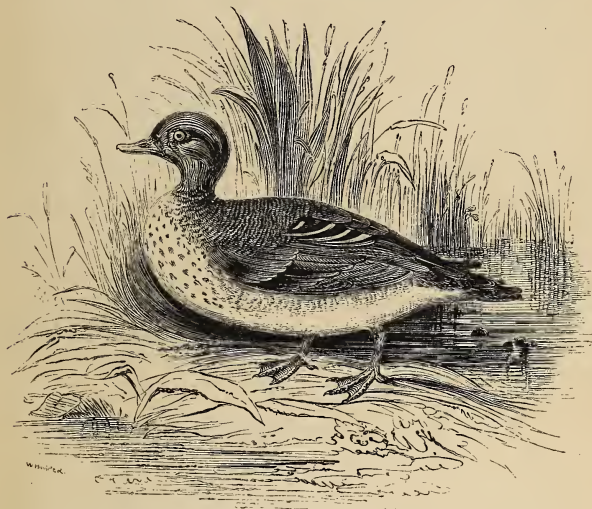
SUMMER DUCK (*Anas Sponsa*).

Under this name Linnæus comprehended in a single genus, not only the birds before us, but even the Geese and Swans. Restricted as it now is, it comprises above a hundred species, distinguished from those birds by the bill being at the base of greater depth than width, the upper mandible hooked at

\* Its Latin name.

the point, where it is broadest. Their legs are comparatively short, and, being far back on the body, walking is performed awkwardly. The neck also is comparatively short, and the size is less than that of the Geese.

They form two natural sections,—the first, consisting of the Fresh-water Ducks, marked by the



THE TEAL (*Anas Crecca*).

hind toe being simple and unwebbed. They are generally more slender in their proportions, walk more easily, and feed more on worms and vegetables than on fish. In some of this division there is a susceptibility of domestication which renders them the companions of the Gallinaceæ in our poultry



yards. Their flesh is juicy, tender, and highly savoury. The Tame Duck, or Mallard, (*A. Boschas*,) the Muscovy, or (more properly) Musk Duck, (*A. Moschata*,) of South America, the lovely little Summer Duck, (*A. Sponsa*,) and the still smaller Teal, (*A. Crecca*,) belong to this division.

The second division has the hind toe broadly bordered by a membrane: their proportions are heavier, the legs are placed more behind, the toes are longer, and more completely webbed. They are peculiarly Sea Ducks, and swim and dive with great facility. To this section are referred the renowned Eider Duck, (*A. Mollissima*,) and the Wigeons, (*A. Rufina*, &c.) From their feeding almost wholly on fish, the flesh of these acquires a rank, oily flavour, very disagreeable; but of some, as the American Canvass-back, (*A. Valisneria*,) which occasionally feeds on vegetable diet, the flesh is highly esteemed.

*Mergus,\* the Merganser.*

This genus consists of birds which again connect the Ducks with the Divers; their beak is long and slender, and, being armed along its edges with small sharp teeth pointing backwards, is well adapted for securing the scaled and slippery prey for which they hunt. They seem to prefer the mouths of rivers and inland lakes, breeding, however, on inac-

\* *Mergo*, to plunge.

cessible rocks on the sea-coast. There are but a few species known, but their geographical range is, nevertheless, very extensive. The northern regions are their home. They are, in general, elegantly-coloured birds: the Smew, or White Nun, (*M. Albellus*,) may sufficiently illustrate the form.

END OF THE FIRST VOLUME.

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